

Service Manual

REPAIR & ADJUSTMENTS



ORDER NO.
ARP-307-0

FM/AM DIGITAL SYNTHESIZED TUNER

TX-940

MODEL TX-940 COMES IN SEVEN VERSIONS DISTINGUISHED AS FOLLOWS:

| Type | Voltage | Remarks |
|------|---------------------------------------|--------------------------|
| KU | AC120V only | U.S.A. model |
| HE | AC220V, 240V (switchable) | European continent model |
| S | AC110V, 120V, 220V, 240V (switchable) | General export model |
| S/G | AC110V, 120V, 220V, 240V (switchable) | U.S. Military model |
| SS | AC110V, 120V, 220V, 240V (switchable) | South Africa model |
| YP | AC240V only | Australia model |
| HEZ | AC220V, 240V (switchable) | West Germany model |

- This service manual is applicable to the KU type. For servicing of the HE, YP, S, S/G and SS types, please refer to the PP 23 – 40.
For servicing of the HEZ type, please refer to the Additional Service Manual.
- For the circuit descriptions, please refer to the TX-940, TX-540, F-50 service manual (ARP-353-0).
- Ce manuel d'instruction se réfère au mode de réglage, en français,
- Este manual de de servicio trata del método de ajuste escrito en español.

CONTENTS

| | | | |
|--|----|-------------------------------|----|
| 1. SPECIFICATIONS | 2 | 9. ADJUSTMENTS | 16 |
| 2. FRONT PANEL FACILITIES | 3 | RÉGLAGE | 18 |
| 3. PARTS LOCATION | 4 | AJUSTE | 20 |
| 4. EXPLODED VIEW | 5 | 10. SAFETY INFORMATION | 22 |
| 5. PACKING | 6 | 11. FOR HE AND YP TYPES | 23 |
| 6. P.C. BOARD CONNECTION DIAGRAM | 7 | 12. FOR SS TYPE | 29 |
| 7. SCHEMATIC DIAGRAM | 11 | 13. FOR S AND S/G TYPES | 35 |
| 8. ELECTRICAL PARTS LIST | 14 | | |

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1. SPECIFICATIONS

FM Tuner Section

| | |
|--|---|
| Frequency Range | 87.5~108.0MHz |
| Usable Sensitivity | Mono; 10.8dBf (0.95μV), 75Ω |
| 50dB Quieting Sensitivity | Mono; 16.2dBf (1.8μV), 75Ω |
| | Stereo; 37.2dBf (19.8μV), 75Ω |
| Sensitivity (DIN) | Mono; 1μV/75Ω |
| | Stereo; 42μV/75Ω |
| Signal-to-Noise Ratio (at 85dBf input) | Mono; 85dB |
| | Stereo; 80dB |
| Signal-to-Noise Ratio (DIN) | Mono; 77dB |
| | Stereo; 60dB |
| Total Harmonic Distortion | Mono; 0.05% (1kHz) |
| | Stereo; 0.08% (1kHz) |
| Capture Ratio | 1.0dB |
| Alternate Channel Selectivity | 400kHz; 56dB |
| Stereo Separation | 1kHz. 50dB |
| Frequency Response | 30Hz~15kHz ^{+0.5} _{-1.0} dB |
| Image Response Ratio | 50dB |
| IF Response Ratio | 80dB |
| Spurious Response Ratio | 70dB |
| AM Suppression Ratio | 60dB |
| Muting Threshold | 30dBf (8.5μV), 75Ω |
| Antenna Input | 300Ω balanced |
| | 75Ω unbalanced |

• The above figures are measured values obtained under the new IHF method.

AM Tuner Section

| | |
|---|-------------------------|
| Frequency Range | 522~1611kHz |
| Usable Sensitivity (accessory loop antenna) | 150μV/m |
| Selectivity | 40dB |
| Signal-to-Noise Ratio | 50dB |
| Image Response Ratio | 40dB |
| IF Response Ratio | 60dB |
| Antenna | Loop antenna (supplied) |

Output Section

| | |
|---------------------------------|-------------|
| Output Terminals (Output Level) | |
| FM (100% MOD) | Fixed 700mV |
| AM (30% MOD) | Fixed 150mV |

PRECAUTIONS ON LITHIUM BATTERY

1. Solder it at the ends of the leads prewelded to the battery in the factory.
2. Be sure to use it within the specified temperature limits. (100°C)
3. Do not short the battery.
Do not dispose it in fire.
Do not try to recharge it.
Do not mis-connect its polarity (+/-).
Do not disassemble it.
Do not expose it to water.
4. Please refer to the schematic diagram when replacing it.

Miscellaneous

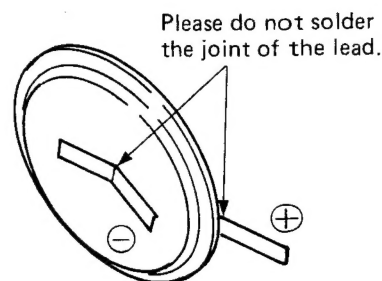
| | |
|------------------------------|--|
| Power Requirements | |
| KU model | AC 120 volts, 60Hz |
| S, SS, S/G models | AC110V/120V/220V/240V (switchable), 50/60Hz |
| YP model | a.c. 240 volts ~, 50Hz |
| HE type | a.c. 220V/240V, 50/60Hz |
| Power Consumption | |
| KU model | 8 watts |
| HE, YP, S, SS and S/G models | 8.5 watts |
| Dimensions | 420(W) x 60(H) x 223(D)mm 16-9/16(W) x 2-3/8(H) x 8-13/16(D) in |
| Weight | 2.5kg (5 lb 8 oz) |

Furnished Parts

| | |
|--------------------------------|---|
| T-type FM Antenna | 1 |
| AM Loop Antenna | 1 |
| Connection Cord with Pin Plugs | 1 |
| Operating Instructions | 1 |

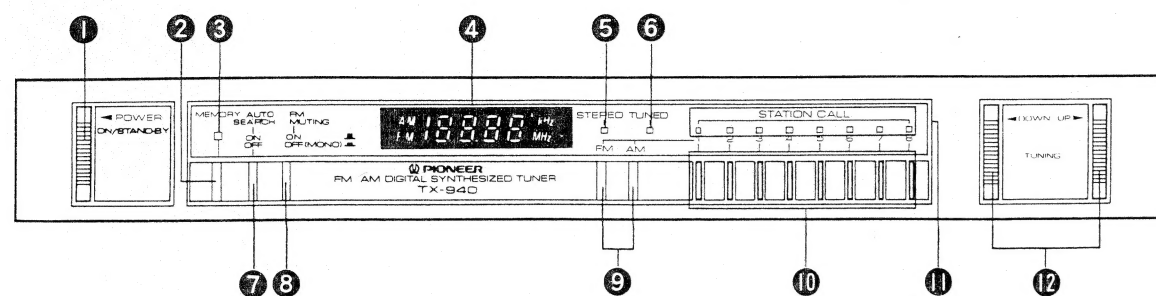
NOTE:

Specifications and design subject to possible modification without notice.



Lithium Battery (AEX-008)

2. FRONT PANEL FACILITIES



1 POWER SWITCH (POWER)

When this switch is set to the ON position, power is supplied to the tuner's main circuits. The unit's power switch is geared to selecting the transformer's secondary and so even at the STAND-BY position, the unit's circuitry will work as long as the power cord is connected to the power outlet. Disconnect the power cord from the AC power outlet when the unit is not in regular use.

2 MEMORY SWITCH

This switch is pressed when presetting the frequency of a broadcast station into one of the STATION CALL switches. Once the station has been preset (or memorized), all you have to do in order to tune in that station is simply press the STATION CALL switch. In other words, there is no need to tune in the same station again every time you want to listen to a program using the tuning switches.

3 MEMORY INDICATOR

This lights when the MEMORY switch is pressed. A station can be preset into one of the STATION CALL switches while this indicator is lighted.

4 FREQUENCY DISPLAY

This indicates the frequency of the station which has been picked up. The frequency is displayed in MHz units for the FM band and in kHz units for the AM band.

5 STEREO INDICATOR

This lights when an FM stereo station has been picked up.

6 TUNED INDICATOR

This lights when a station is picked up. Operate the TUNING switches so that this indicator lights. It will not light, however, if a station's signals are too weak, even if the frequency of that station has been tuned in properly.

7 AUTO SEARCH SWITCH

This is used to select the tuning mode: auto search or manual search.

8 FM MUTING SWITCH

Normally this switch is kept at the ON (released) position. When an FM station is picked up, the muting circuit is activated, the inter-station noise is suppressed and the tuning operation itself is made more pleasant. When the desired station cannot be received with this switch at ON (for instance, when the station is too distant and its signals are weak or when noise drowns out stereo reception), depress the switch to the OFF (MONO) position.

9 BAND SELECTOR SWITCHES

FM : Press this for FM reception.
AM : Press this for AM reception.

10 STATION CALL SWITCHES

These switches are pressed when presetting broadcast stations and also when recalling preset stations. Each switch can accommodate an FM station and an AM station: since there are 8 switches in all, a total of 16 stations can be preset.

11 STATION CALL INDICATORS

When any of the STATION CALL switches 1 through 8 is pressed, the corresponding indicator above the switch lights to indicate that a station is preset.

12 TUNING SWITCHES

These are used for tuning in stations. Press the UP switch to tune in a station with a frequency higher than that displayed; press the DOWN switch to tune in a station with a frequency lower than that displayed. The frequency will change continuously when the TUNING switches are kept in the depressed position.

CAUTION WITH AUTO-SEARCH:

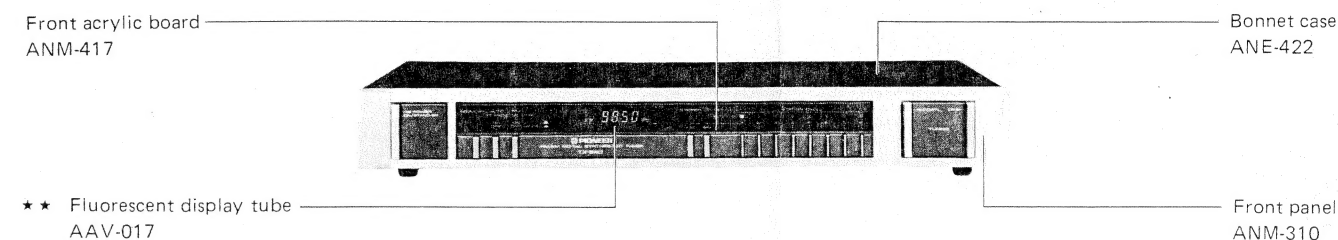
- Since this is a highly sensitive mechanism, the frequency search operation may stop even with weak foreign broadcasts, particularly at night. Also, frequency noise in large cities may also cause the search operation to stop.
- When using Auto-Search to preset AM stations, if the frequency search operation stops too frequently, changing the position of the AM loop antenna may be of help in reducing its sensitivity so that only powerful, nearby stations are received. After tuning in the station, be sure to reposition the antenna to its best position for reception.
- For very weak stations, use the manual tuning mode to preset stations.

3. PARTS LOCATION

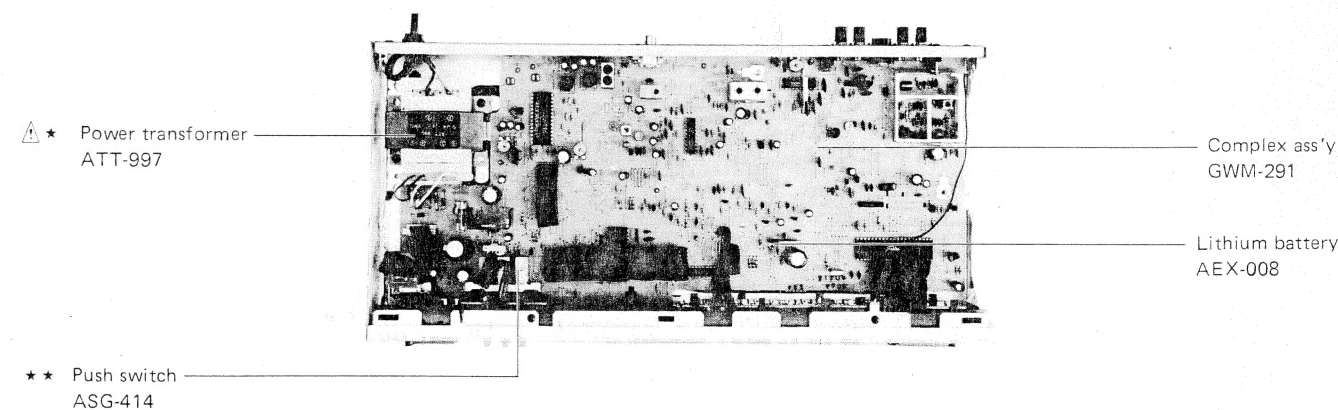
NOTES:

- The mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
- For your Parts Stock Control, the fast moving items are indicated with the marks **★★** and **★**.
★★ GENERALLY MOVES FASTER THAN ★
This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.

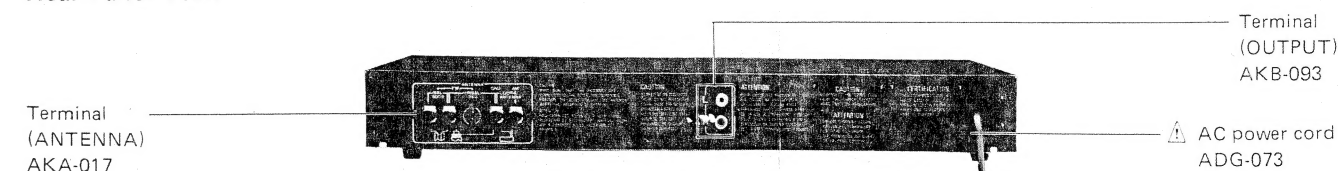
Front Panel View



Top View



Rear Panel View



Parts

Mark

4. EXPLODED VIEW

Importance of the parts of identical parts indicated with the marks depends on model

Bonnet case ANE-422

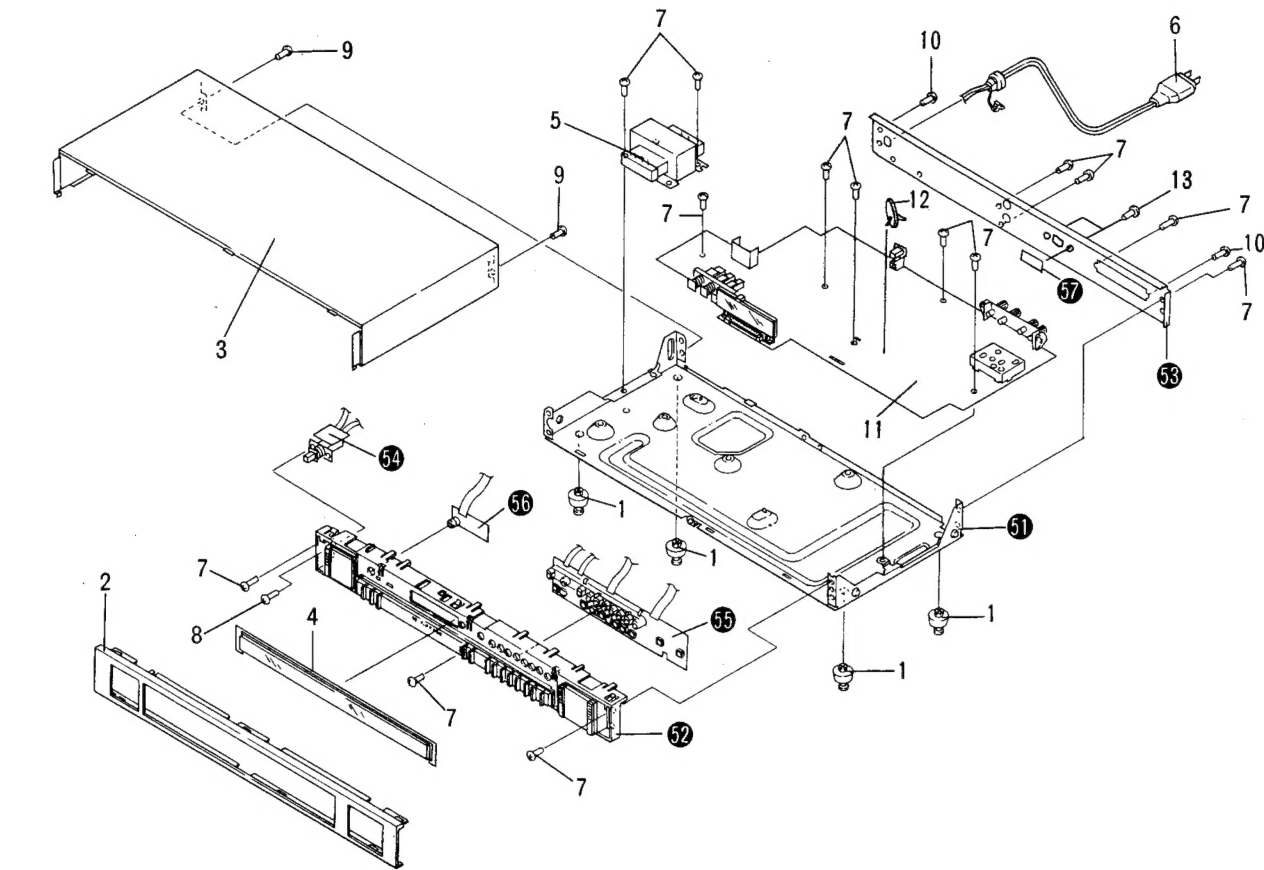
Front panel ANM-310

Complex ass'y GWM-291


Lithium battery AEX-008



Terminal (OUTPUT) AKB-093

AC power cord ADG-073



Parts List

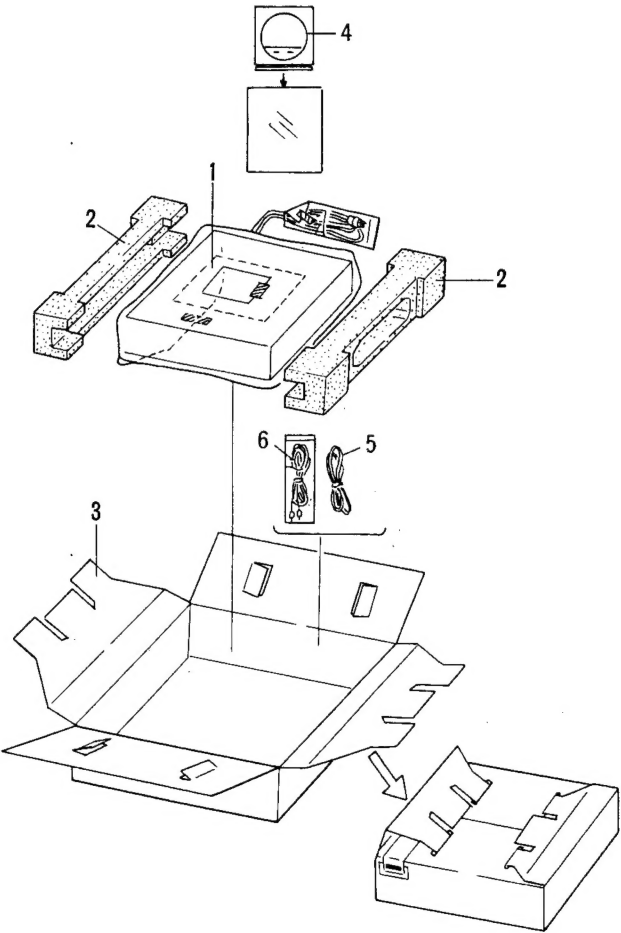
NOTES:
• Parts without part number cannot be supplied.
• The  mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
• For your Parts Stock Control, the fast moving items are indicated with the marks **★★** and **★**.
★★ GENERALLY MOVES FASTER THAN ★
This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.

| Mark | No. | Part No. | Description | Mark | No. | Part No. | Description |
|---|------|--------------|---------------------|------|--------------|--------------------|-------------|
| | 1. | AEC-903 | Leg ass'y | 11. | GWM-291 | Complex ass'y | |
| | 2. | ANM-310 | Front panel | 12. | AEX-008 | Lithium battery | |
| | 3. | ANE-422 | Bonnet case | 13. | PMZ30P040FZB | Screw (3x4) | |
| | 4. | ANM-417 | Front acrylic board | 51. | | Chassis | |
|  | ★ 5. | ATT-997 | Power transformer | 52. | | Panel stay ass'y | |
| | 6. | ADG-073 | AC power cord | 53. | | Rear panel | |
|  | 7. | BBZ30P080FZK | Screw (3x8) | 54. | | Power switch ass'y | |
| | 8. | PMZ30P060FMC | Screw (3x6) | 55. | | LED ass'y | |
| | 9. | BBT30P080FZK | Screw (3x8) | 56. | | LED ass'y S | |
| | 10. | ABA-115 | Screw | 57. | | Switch ass'y 1 | |

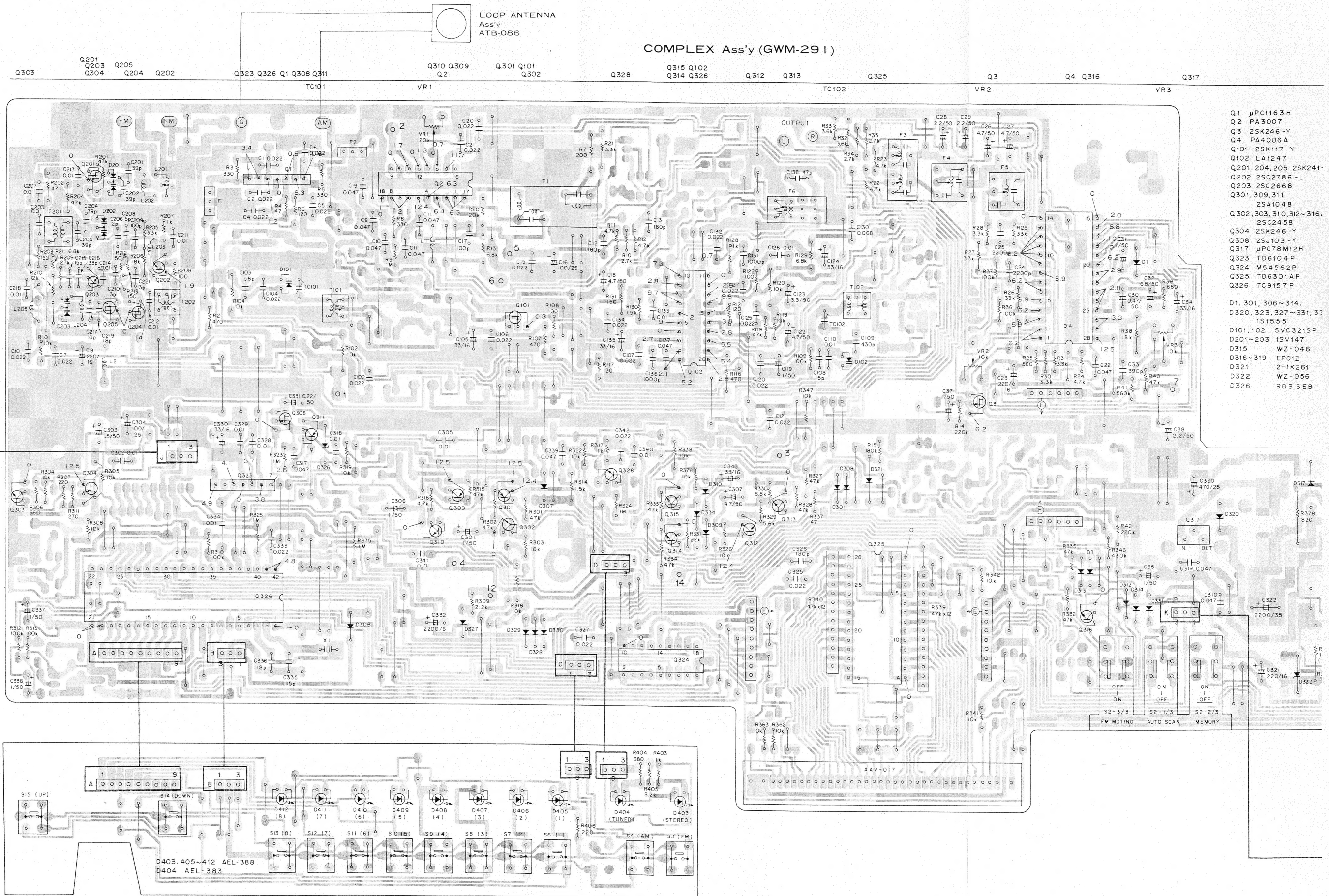
5. PACKING

Parts List

| Mark | No. | Part No. | Description |
|------|-----|----------|------------------------|
| | 1. | ARB-558 | Operating instructions |
| | 2. | AHA-341 | Side pad |
| | 3. | AHE-198 | Packing case |
| | 4. | ATB-086 | Loop antenna ass'y |
| | 5. | ADH-005 | FM antenna |
| | 6. | ADE-015 | Connection cord |



6. P.C.BOARD CONNECTION DIAGRAM



7

8

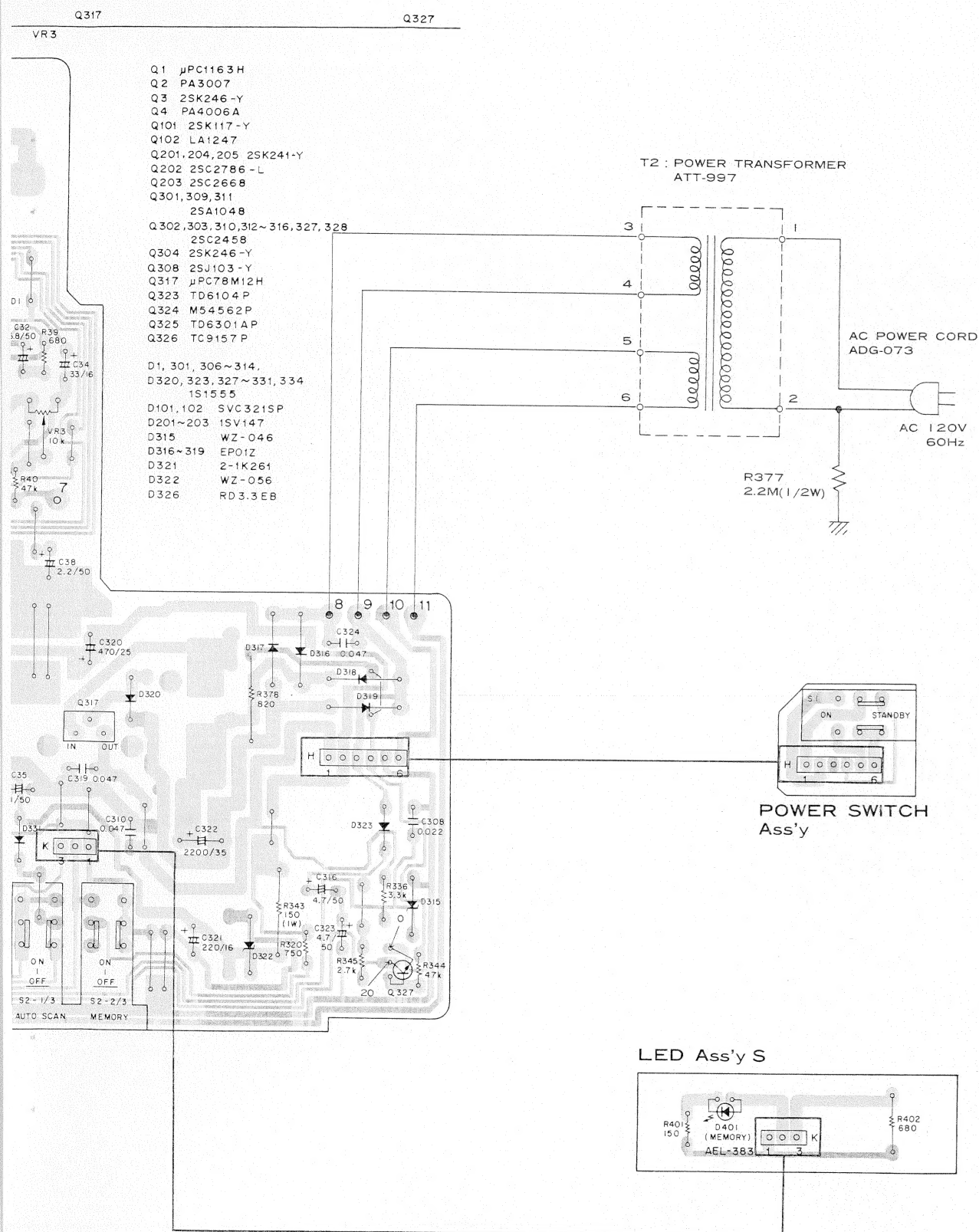
9

10

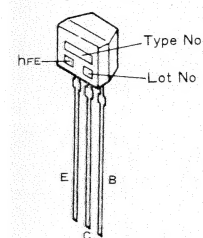
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12

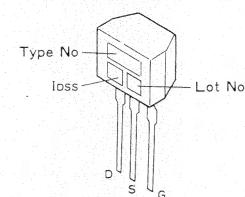
External Appearance of Transistors and ICs



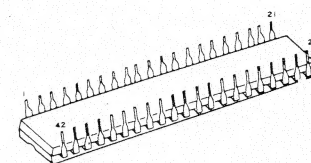
2SC2786



2SK241

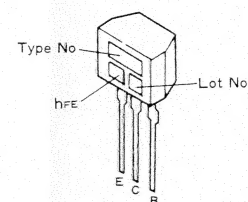


TC9157P

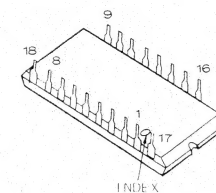


A

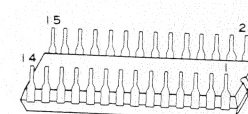
2SC2668



PA3007

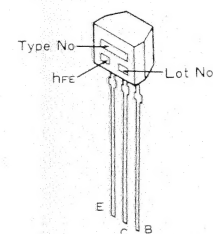


TD6301AP

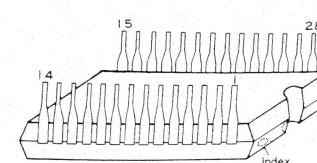


B

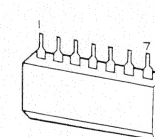
2SC2458
2SA1048



PA4006A

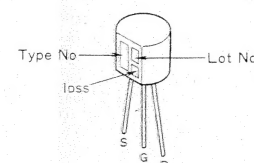


TD6104P

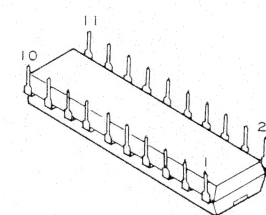


C

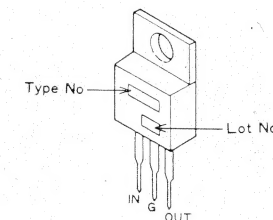
2SK246
2SJ103



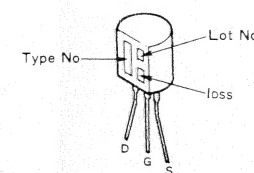
LA1247



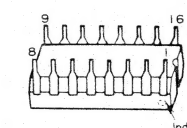
μPC78M12H



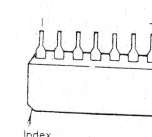
2SK117



M54562P

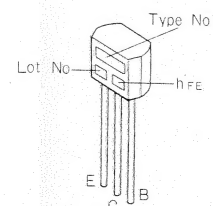


μ PC1163H



D

2SK2603
2SA1115



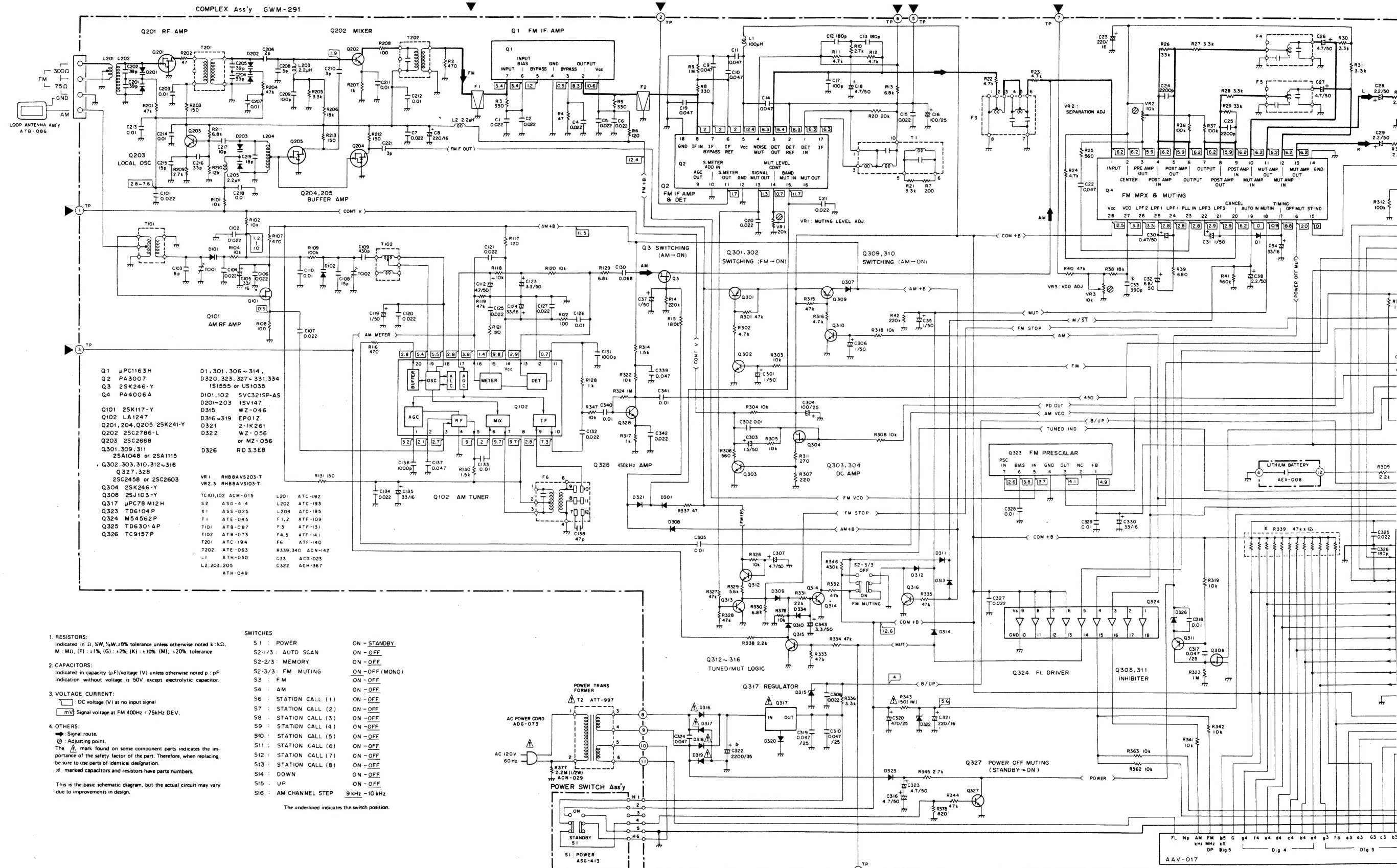
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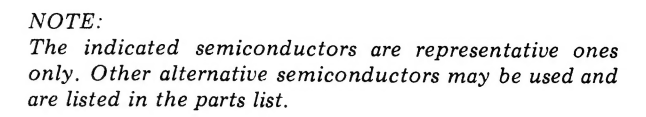
10

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12

7. SCHEMATIC DIAGRAM





0

8. ELECTRICAL PARTS LIST

NOTES:

- When ordering resistors, first convert resistance values into code form as shown in the following examples.
Ex. 1 When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J=5%, and K=10%).
560Ω 56 × 10¹ 561..... RD¼PS 561 J
47kΩ 47 × 10³ 473..... RD¼PS 473 J
0.5Ω 0R5 RN2H 0R5 K
1Ω 010 RS1P 010 K
Ex. 2 When there are 3 effective digits (such as in high precision metal film resistors).
5.62kΩ 562 × 10¹ 5621 RN¼SR 5621 F
- The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
- For your Parts Stock Control, the fast moving items are indicated with the marks ★★ and ★
★★ GENERALLY MOVES FASTER THAN ★
This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.:

Miscellaneous Parts

| Mark | Part No. | Symbol & Description |
|------|----------|---|
| | GWM-291 | Complex ass'y Power switch ass'y LED ass'y LED ass'y S Switch ass'y 1 |
| ⚠ | ACN-029 | R377 Carbon composition |
| | AEX-008 | Lithium battery |
| ⚠ ★ | ATT-997 | T2 Power transformer |
| ⚠ | ADG-073 | AC power cord |

Complex Assembly (GWM-291)

SEMICONDUCTORS

| Mark | Part No. | Symbol & Description |
|------|----------------------|--|
| ★★ | 2SC2786-L | Q202 |
| ★★ | 2SC2668 | Q203 |
| ★★ | 2SC2458 (2SC2603) | Q302, Q303, Q310, Q312~Q316, Q327, Q328 |
| ★★ | 2SA1048 (2SA1115) | Q301, Q309, Q311 |
| ★★ | 2SK246-Y | Q304, Q3 |
| ★★ | PA3007 (PA3007-A) | Q2 |
| ★★ | PA4006-A (PA4006) | Q4 |
| ★★ | LA1247 | Q102 |
| ★★ | M54562P | Q324 |
| ★★ | TC9157P | Q326 |
| ★★ | TD6301AP | Q325 |
| ★★ | TD6104P | Q323 |
| ★★ | μPC1163H | Q1 |

| Mark | Part No. | Symbol & Description |
|------|---------------|---|
| ⚠ ★★ | μPC78M12H | Q317 |
| ★★ | 2SK117-Y | Q101 |
| ★★ | 2SK241-Y | Q201, Q204, Q205 |
| ★★ | 2SJ103-Y | Q308 |
| | ★ SVC321SP-AS | D101, D102 |
| | ★ 1SV147 | D201~D203 |
| ⚠ ★ | EP01Z | D316~D319 |
| ★ | WZ-046 | D315 |
| ★ | WZ-056 | D322 |
| | (MZ-056) | |
| ★ | RD3.3EB | D326 |
| ★ | IS1555 | D1, D301, D306~D314, D320, D323, D327~D331, D334 |
| ★ | 2-1K261 | D321 |

SWITCH

| Mark | Part No. | Symbol & Description |
|------|----------|----------------------|
| ★★ | ASG-414 | S2 Push switch |

TRANSFORMERS, COILS AND FILTERS

| Mark | Part No. | Symbol & Description |
|------|----------|------------------------------|
| | ATC-192 | L201 FM ANT coil |
| | ATC-193 | L202 FM ANT coil |
| | ATC-195 | L204 FM OSC coil |
| | ATH-049 | L2, L203, L205 RF choke coil |
| | ATH-050 | L1 RF choke coil |
| | ATC-194 | T201 FM RF coil |
| | ATE-045 | T1 FM DET coil |
| | ATB-087 | T101 AM ANT coil |
| | ATB-073 | T102 AM OSC coil |
| | ATE-063 | T202 FM IF transformer |
| | ATF-141 | F4, F5 Lowpass filter |
| | ATF-109 | F1, F2 FM ceramic filter |

| Mark | Part No. | Symbol & Description |
|------|----------|--------------------------|
| | ATF-131 | F3 Beat eliminate filter |
| | ATF-140 | F6 AM ceramic filter |

CAPACITORS

| Mark | Part No. | Symbol & Description |
|------|---------------|---|
| | ACM-015 | TC101, TC102 Ceramic trimmer |
| | ACG-023 | C33 Ceramic |
| | ACH-367 | C322 Electrolytic |
| | CKPYX 103N 25 | C334 |
| | CQSA 431J 50 | C109 |
| | CEA 222M 6L | C332 |
| | CEA 471M 25L | C320 |
| | CKDYF 103Z 50 | C110, C126, C133, C203, C207, C211~C214, C218, C302, C305, C329, C341, C318, C328, C340 C1, C2, C4~C7, C15, C20, C21, C101, C102, C104, C106, C107, C120, C121, C125, C127, C132, C134, C308, C325, C327, C333, C342 |
| | CKDYF 223Z 50 | C9~C11, C19, C14, C22, C137, C324, C339 |
| | CKDYX 473M 25 | C310, C317, C319 |
| | CKDYB 102K 50 | C131, C136 |
| | CCDSL 020C 50 | C206 |
| | CCDSL 030C 50 | C210, C221 |
| | CCDSL 050C 50 | C208 |
| | CCDCH 080D 50 | C103 |
| | CCDCH 150J 50 | C108, C215, C335 |
| | CCDCH 100D 50 | C217 |
| | CCDTH 180J 50 | C219 |
| | CCDCH 180J 50 | C336 |
| | CCDCH 330J 50 | C216 |
| | CCDCH 470J 50 | C138 |
| | CCDRH 390J 50 | C201, C202, C204, C205 |
| | CCDSL 101J 50 | C17, C209 |
| | CQMA 683J 50 | C130 |
| | CCDSL 181J 50 | C12, C13, C326 |
| | CQMA 222J50 | C24, C25 |
| | CEA R22M 50L | C331 |
| | CEA R47M 50L | C30 |
| | CEA 010M 50L | C31, C35, C119, C301, C37, C306, C337, C338 |
| | CEA 1R5M 50L | C303, C316, C323 |
| | CEA 2R2M 50L | C28, C29, C38 |
| | CEA 3R3M 50L | C123 |
| | CEA 4R7M 50L | C18, C26, C27, C122, C307, C316, C323 |
| | CEA 6R8M 50L | C32 |
| | CEA 330M 16L | C105, C124, C135, C34, C330, C343 |
| | CEA 101M 25L | C16, C304 |
| | CEA 221M 16L | C8, C23, C321 |

RESISTORS

NOTE: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.

| Mark | Part No. | Symbol & Description |
|------|--------------|----------------------|
| ★ | RHB8AVS203-T | VR1 Semifixed |
| ★ | RHB8AVS103-T | VR2, VR3 Semifixed |

| Mark | Part No. | Symbol & Description |
|------|-------------|---------------------------|
| | RD¼PM821J | R378 |
| | RN¼PQ1802F | R38 |
| ⚠ | RN¼PQ3301F | R21 |
| | RS1LF151J | R343 |
| | ACN-142 | R339, R340 Resister array |
| | RD1/8PM□□□J | Other resistors |

OTHERS

| Mark | Part No. | Symbol & Description |
|------|--------------|--------------------------|
| | AKA-017 | Terminal (ANTENNA) |
| | AKB-093 | Terminal (OUTPUT) |
| | PBZ30P060FMC | Screw (3x6) |
| ★ | ASS-025 | X1 Crystal resonator |
| ★ | AAV-017 | Flourescent display tube |

LED Assembly

SEMICONDUCTORS

| Mark | Part No. | Symbols & Description |
|------|----------|---------------------------|
| ★ | AEL-388 | D403, D405~D412 LED (Red) |
| ★ | AEL-383 | D404 LED (Green) |

SWITCH

| Mark | Part No. | Symbols & Description |
|------|----------|----------------------------|
| ★★ | ASG-703 | S3, S4, S6~S15 Tact switch |

RESISTORS

NOTE: When ordering resistors, convert the resistance value into code form, and then reurite the part no. as before.

| Mark | Part No. | Symbols & Description |
|------|----------------|-----------------------|
| | RD 1/8 PM □□□J | R403 ~ R406 |

LED Ass'y S

SEMICONDUCTOR.

| Mark | Part No. | Symbols & Description |
|------|----------|-----------------------|
| ★ | AEL-383 | D401 LED (Green) |

RESISTORS

| Mark | Part No. | Symbols & Description |
|------|----------------|-----------------------|
| | RD 1/8 PM 151J | R401 |
| | RD 1/4 PM 681J | R402 |

Power Switch Assembly

SWITCH

| Mark | Part No. | Symbol & Description |
|------|----------|----------------------|
| ★★ | ASG-413 | S1 Push switch |

Switch Assembly 1

SWITCH

| Mark | Part No. | Symbol & Description |
|------|----------|---------------------------------------|
| ★★ | ASH-028 | S16 Slide switch (AM CHANNEL STEP) |

9. ADJ.

FM Tuner Se

- Connect 1 dummy a
- Set the T
- Set the FM (*1) Tune
- (*2) Conne the m

| Step | (400F Frec |
|------|---------------------|
| 1 | 98.0M |
| 2 | 98.0M |
| 3 | 98.0M |
| 4 | Repeat s |
| 5 | Set the F |
| 6 | 98.0M |
| 7 | 98.0M Ster (M |
| 8 | 98.0M Ste |
| 9 | 98.0M |

AM Tuner S

- Connect t
- Connect t
- Set the T
- Set the Al (*3) Tune

| Step | (400F Frec |
|------|---------------|
| 1 | |
| 2 | |
| 3 | Repeat s |
| 4 | 603k |
| 5 | 1395l |
| 6 | Repeat s |

| Mark | Part No. | Symbol & Description |
|------|----------|--------------------------|
| | ATF-131 | F3 Beat eliminate filter |
| | ATF-140 | F6 AM ceramic filter |

CAPACITORS

| Mark | Part No. | Symbol & Description |
|------|---------------|--|
| | ACM-015 | TC101, TC102 Ceramic trimmer |
| | ACG-023 | C33 Ceramic |
| | ACH-367 | C322 Electrolytic |
| | CKPYX 103N 25 | C334 |
| | CQSA 431J 50 | C109 |
| | CEA 222M 6L | C332 |
| | CEA 471M 25L | C320 |
| | CKDYF 103Z 50 | C110, C126, C133, C203, C207, C211~C214, C218, C302, C305, C329, C341, C318, C328, C340 C1, C2, C4~C7, C15, C20, C21, C101, C102, C104, C106, C107, C120, C121, C125, C127, C132, C134, C308, C325, C327, C333, C342 |
| | CKDYF 473Z 50 | C9~C11, C19, C14, C22, C137, C324, C339 |
| | CKDYX 473M 25 | C310, C317, C319 |
| | CKDYB 102K 50 | C131, C136 |
| | CCDSL 020C 50 | C206 |
| | CCDSL 030C 50 | C210, C221 |
| | CCDSL 050C 50 | C208 |
| | CCDCH 080D 50 | C103 |
| | CCDCH 150J 50 | C108, C215, C335 |
| | CCDCH 100D 50 | C217 |
| | CCDTH 180J 50 | C219 |
| | CCDCH 180J 50 | C336 |
| | CCDCH 330J 50 | C216 |
| | CCDCH 470J 50 | C138 |
| | CCDRH 390J 50 | C201, C202, C204, C205 |
| | CCDSL 101J 50 | C17, C209 |
| | CQMA 683J 50 | C130 |
| | CCDSL 181J 50 | C12, C13, C326 |
| | CQMA 222J50 | C24, C25 |
| | CEA R22M 50L | C331 |
| | CEA R47M 50L | C30 |
| | CEA 010M 50L | C31, C35, C119, C301, C37, C306, C337, C338 |
| | CEA 1R5M 50L | C303, C316, C323 |
| | CEA 2R2M 50L | C28, C29, C38 |
| | CEA 3R3M 50L | C123 |
| | CEA 4R7M 50L | C18, C26, C27, C122, C307, C316, C323 |
| | CEA 6R8M 50L | C32 |
| | CEA 330M 16L | C105, C124, C135, C34, C330, C343 |
| | CEA 101M 25L | C16, C304 |
| | CEA 221M 16L | C8, C23, C321 |

RESISTORS

NOTE:When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.

| Mark | Part No. | Symbol & Description |
|------|--------------|----------------------|
| ★ | RHB8AVS203-T | VR1 Semifixed |
| ★ | RHB8AVS103-T | VR2, VR3 Semifixed |

| Mark | Part No. | Symbol & Description |
|------|-------------|---------------------------|
| | RD¼PM821J | R378 |
| | RN¼PQ1802F | R38 |
| | RN¼PQ3301F | R21 |
| | RS1LF151J | R343 |
| | ACN-142 | R339, R340 Resister array |
| | RD1/8PM□□□J | Other resistors |

OTHERS

| Mark | Part No. | Symbol & Description |
|------|--------------|--------------------------|
| | AKA-017 | Terminal (ANTENNA) |
| | AKB-093 | Terminal (OUTPUT) |
| | PBZ30P060FMC | Screw (3x6) |
| ★ | ASS-025 | X1 Crystal resonator |
| ★ | AAV-017 | Flourescent display tube |

LED Assembly

SEMICONDUCTORS

| Mark | Part No. | Symbols & Description |
|------|----------|---------------------------|
| ★ | AEL-388 | D403, D405~D412 LED (Red) |
| ★ | AEL-383 | D404 LED (Green) |

SWITCH

| Mark | Part No. | Symbols & Description |
|------|----------|----------------------------|
| ★ ★ | ASG-703 | S3, S4, S6~S15 Tact switch |

RESISTORS

NOTE:When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.

| Mark | Part No. | Symbols & Description |
|------|-------------------|-----------------------|
| | RD 1/8 PM □ □ □ J | R403 ~ R406 |

LED Ass'y S

SEMICONDUCTOR.

| Mark | Part No. | Symbols & Description |
|------|----------|-----------------------|
| ★ | AEL-383 | D401 LED (Green) |

RESISTORS

| Mark | Part No. | Symbols & Description |
|------|----------------|-----------------------|
| | RD 1/8 PM 151J | R401 |
| | RD 1/4 PM 681J | R402 |

Power Switch Assembly

SWITCH

| Mark | Part No. | Symbol & Description |
|------|----------|----------------------|
| ★ ★ | ASG-413 | S1 Push switch |

Switch Assembly 1

SWITCH

| Mark | Part No. | Symbol & Description |
|------|----------|---------------------------------------|
| ★ ★ | ASH-028 | S16 Slide switch (AM CHANNEL STEP) |

9. ADJUSTMENTS

FM Tuner Section

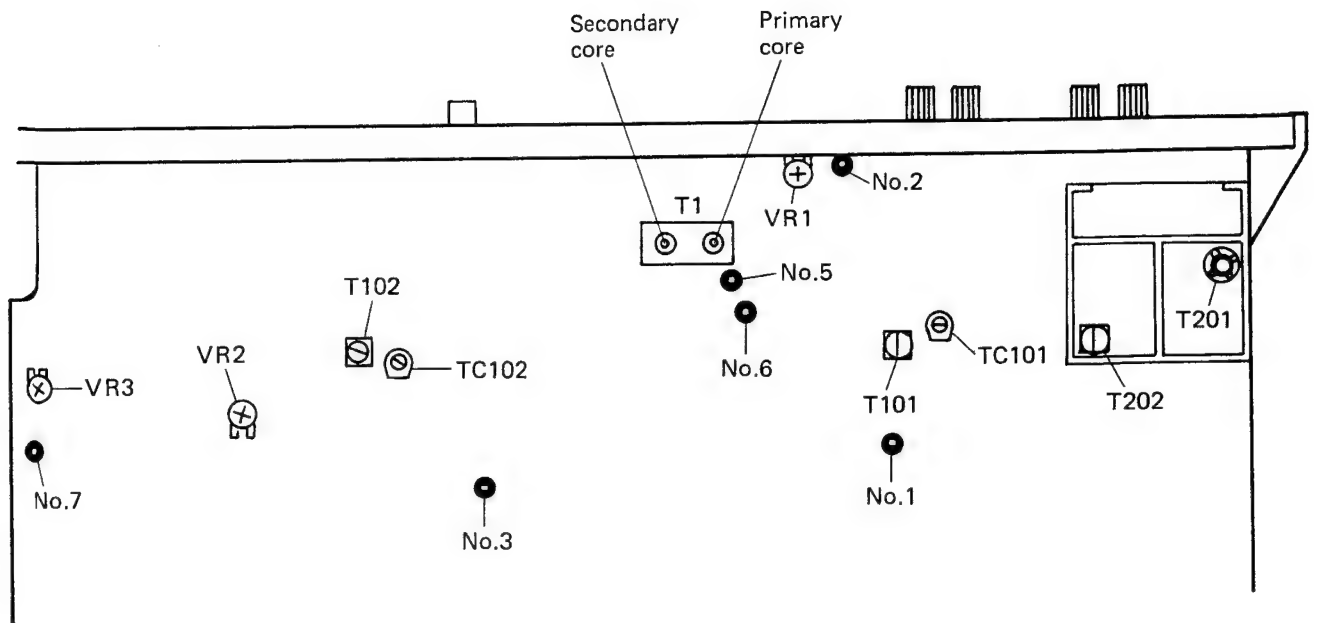
- Connect the FM signal generator (FM SG) to the FM ANTENNA 300Ω terminal through a 300Ω dummy antenna.
 - Set the TX-940 to the FM band and MANUAL tuning mode.
 - Set the FM MUTING switch to the OFF position.
- (*1) Tune the FM SG to the TX-940.
- (*2) Connect the FM multiplex stereo signal generator to the FM SG external modulator terminal. Set the modulation to Main 1kHz/L +R/±67.5kHz deviation, Pilot 19kHz/±7.5kHz deviation.

| Step | FM SG (400Hz, ±75kHz deviation) | | TX-940 Frequency display | Adjustment point | Adjustment procedure |
|------|---|--|--------------------------------|------------------------|---|
| | Frequency | Level | | | |
| 1 | 98.0MHz(*1) | 20dB | 98.0MHz | T201, T202 | Adjust until DC voltage between terminal no.2 and ground is maximum. |
| 2 | 98.0MHz(*1) | 66dB | 98.0MHz | T1 (primary core) | Adjust DC voltage between terminal no.5 and no.6 to 0V (within ±3mV). |
| 3 | 98.0MHz(*1) | 86dB | 98.0MHz | T1 (secondary core) | Minimize the distortion of the OUTPUT terminal signal. |
| 4 | Repeat steps 2 and 3 until both requirements are satisfied. | | | | |
| 5 | Set the FM MUTING switch to the ON position. | | | | |
| 6 | 98.0MHz(*1) | 86dB not modulation | 98.0MHz | VR3 | Adjust signal between terminal no.7 and ground to 76kHz (within ±76Hz). |
| 7 | 98.0MHz(*1) | 86dB Stereo modulation(*2) (Main=1kHz, L or R) | 98.0MHz | VR2 | Adjust so that separation at OUTPUT terminal is balanced between R and L channels and maximized at the same time. |
| 8 | 98.0MHz(*1) | 86dB Stereo modulation(*2) | 98.0MHz | T202 (within ±90°) | Adjust until distortion at OUTPUT L or R terminal is minimum. |
| 9 | 98.0MHz(*1) | 36dB | 98.0MHz | VR1 | Adjust just before muting is effected. |

AM Tuner Section

- Connect the furnished AM loop antenna between terminals AM ANTENNA and GND.
 - Connect the AM signal generator (AM SG) to the AM ANTENNA terminal through a 10kΩ resistor.
 - Set the TX-940 to the AM (MW) band and MANUAL tuning mode.
 - Set the AM CHANNEL STEP switch to the 9kHz position (KU, S and S/G types).
- (*3) Tune the AM SG to the TX-940.

| Step | AM SG (400Hz, 30% modulation) | | TX-940 Frequency display | Adjustment point | Adjustment procedure |
|------|---|-------|--------------------------------|---------------------|--|
| | Frequency | Level | | | |
| 1 | No signal | | 522kHz | T102 | 1.2V DC between terminal no.1 and ground. |
| 2 | No signal | | 1611kHz | TC102 | 10V DC between terminal no.1 and ground. |
| 3 | Repeat steps 1 and 2 until both specifications are correct. | | | | |
| 4 | 603kHz(*3) | 76dB | 603kHz | T101 | Adjust until DC voltage between terminal no.3 and ground is maximum. |
| 5 | 1395kHz(*3) | 76dB | 1395kHz | TC101 | |
| 6 | Repeat steps 4 and 5 until maximum sensitivity is attained. | | | | |



9. RÉGLAGE

Section accordeur MF

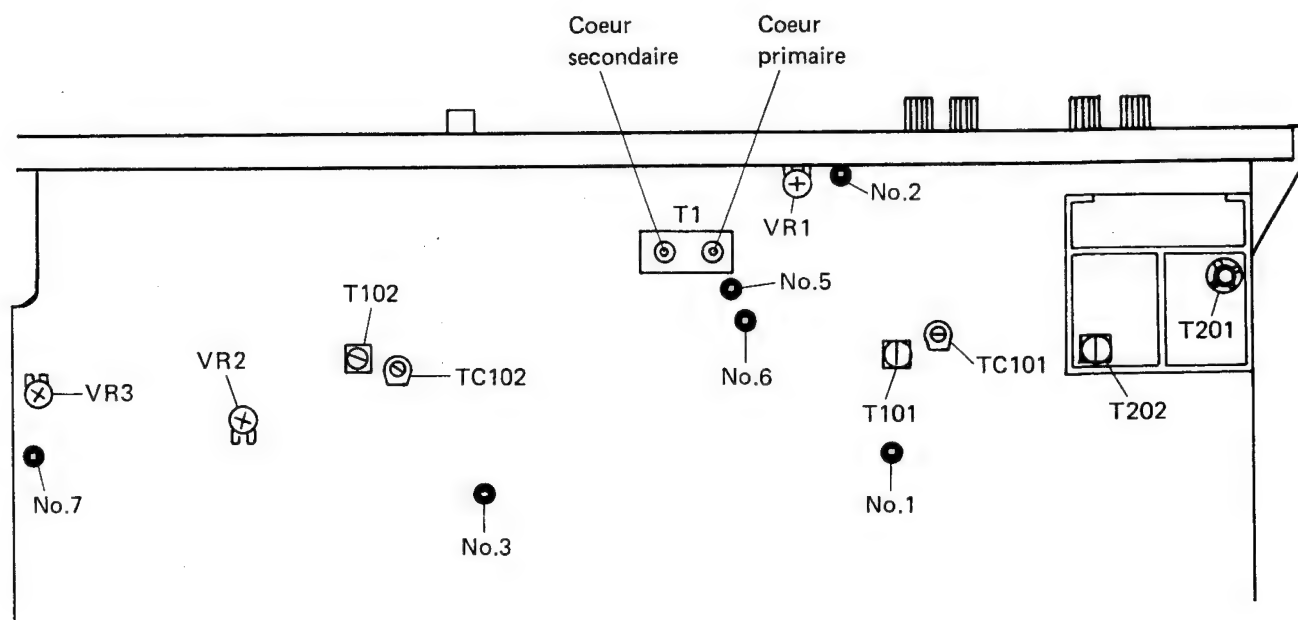
- Brancher le générateur de signal MF (FM SG) sur la borne de 300 Ohms de l'antenne MF au moyen d'une antenne fictive de 300 Ohms.
 - Régler le TX-940 sur la bande MF et sur le mode d'accord manuel.
 - Déplacer le sélecteur de réglage silencieux FM (FM MUTING) sur la position OFF.
- (*1) Accorder le FM SG sur le TX-940.
- (*2) Brancher le générateur de signal stéréo multiplex MF sur la borne de modulation externe du FM SG. Régler la modulation du conducteur principal à une déviation de 1kHz/L+R/±67,5kHz, le pilote à une déviation de 19kHz/±7,5kHz.

| Phase | FM SG (déviation de 400Hz, ±75kHz) | | TX-940 Affichage de fréquence | Point de réglage | Méthode de réglage |
|-------|--|--------|-------------------------------------|-------------------------|---|
| | Frequence | Niveau | | | |
| 1 | 98,0MHz (*1) | 20dB | 98,0MHz | T201,T202 | Régler jusqu'à ce que la tension CC entre la borne n° 2 et la masse soit au maximum. |
| 2 | 98,0MHz (*1) | 66dB | 98,0MHz | T1 (cœur primaire) | Régler jusqu'à ce que la tension CC entre les borne n° 5 et n° 6 au 0V (±3mV). |
| 3 | 98,0MHz (*1) | 86dB | 98,0MHz | T1 (cœur secondaire) | Régler au minimum la distortion du signal de la borne de sortie (OUTPUT) |
| 4 | Répéter les phase 2 et 3 jusqu'à ce que les spécifications soient correctes. | | | | |
| 5 | Déplacer le sélecteur de réglage silencieux FM (FM MUTING) sur la position ON. | | | | |
| 6 | 98,0MHz (*1) | 86dB | 98,0MHz | VR3 | Régler le signal à 76kHz (±400Hz) entre la borne n° 7 et la masse. |
| | pas de modulation | | | | |
| 7 | 98,0MHz (*1) | 86dB | 98,0MHz | VR2 | Procéder au réglage afin qu'au niveau de la borne de sortie (OUTPUT) la séparation soit répartie d'une façon optimale entre les canaux droit et gauche. |
| | (Modulation stéréo (*2) (Principal=1kHz gauche ou droite) | | | | |
| 8 | 98,0MHz (*1) | 86dB | 98,0MHz | T202 (Entre ±90°) | Régler jusqu'à ce que la distorsion aux bornes de sortie gauche et droite soit au minimum. |
| | Modulation stéréo (*2) | | | | |
| 9 | 98,0MHz (*1) | 36dB | 98,0MHz | VR1 | Procéder au réglage juste avant d'enclencher le commutateur de silence (MUTING). |

Section accordeur MA

- Brancher l'antenne bouclée MA fournie entre les bornes d'antenne MA et la masse.
 - Brancher le générateur de signal MA (AM SG) sur la borne d'antenne MA à travers une résistance de 10 kOhms.
 - Régler le TX-940 sur la bande MA (Ondes moyennes) et sur le mode d'accord manuel.
 - Positionner le commutateur de canaux AM sur la position de 9kHz (type KU, S et S/G).
- (*3) Accorder le AM SG sur le TX-940.

| Phase | AM SG (Modulation 400Hz, 30%) | | TX-940 Affichage de fréquence | Point de réglage | Méthode de réglage |
|-------|---|--------|-------------------------------------|---------------------|--|
| | Fréquence | Niveau | | | |
| 1 | Pas de signal | | 522kHz | T102 | 1,2V CC entre la borne n° 1 et la masse. |
| 2 | Pas de signal | | 1611kHz | TC102 | 10V CC entre la borne n° 1 et la masse. |
| 3 | Répéter les phase 1 et 2 jusqu'à ce que les spécifications soient correctes. | | | | |
| 4 | 603kHz (*3) | 76dB | 603kHz | T101 | Régler jusqu'à ce que la tension CC entre la borne n° 3 et la masse soit au maximum. |
| 5 | 1395kHz (*3) | 76dB | 1395kHz | TC101 | |
| 6 | Répéter les phase 4 et 5 jusqu'à ce que soit atteint le maximum de sensibilité. | | | | |



9. AJUSTE

Sección del sintonizador de FM

- Conectar el generador de señales de FM (FM SG) al terminal FM ANTENNA 300Ω a través de una antena ficticia de 300Ω.
- Ajustar el TX-940 a la banda de AM (MW) y al modo de sintonización MANUAL.
- Poner el interruptor de silenciamiento en FM (FM MUTING) en la posición OFF.

(*1) Sintonizar el FM SG con el TX-940.

(*2) Conectar el generador de señales estereofónicas de multiplex de FM al terminal de modulación exterior del FM SG.

Ajustar la modulación a Principal 1kHz/L+R/±67,5kHz de desviación y Piloto 19kHz/±7,5kHz de desviación.

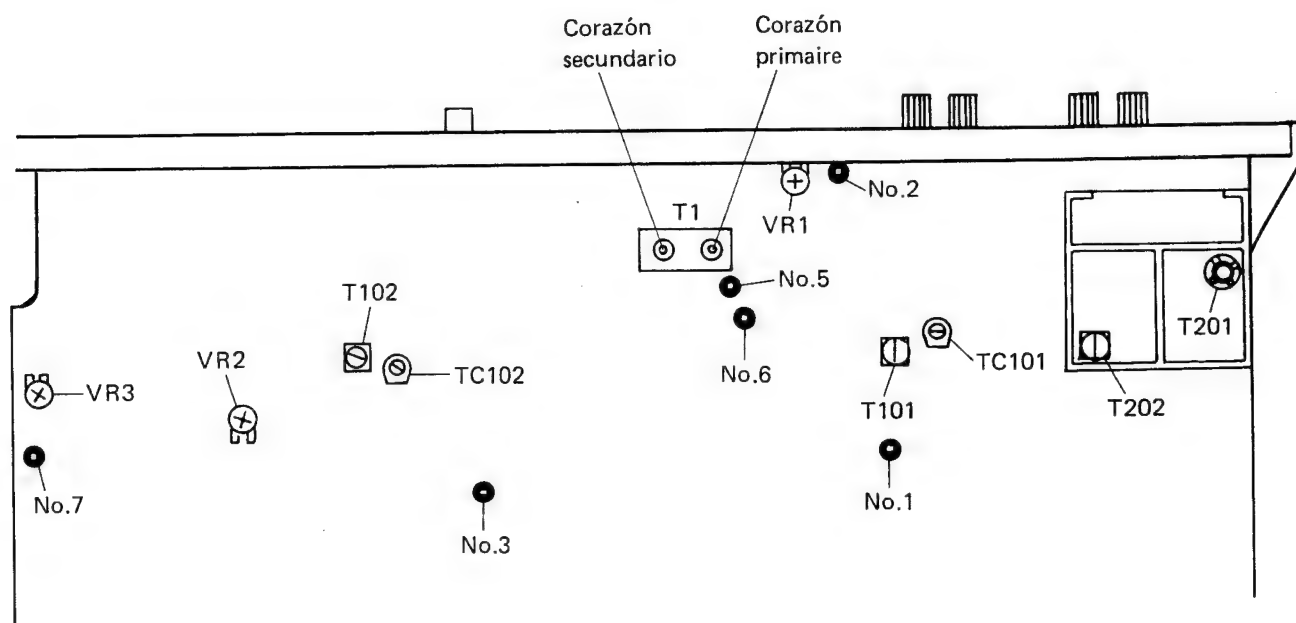
| Paso | FM SG (400Hz, desviación de ±75kHz) | | Frecuenci- metro del TX-940 | Puntos de ajuste | Procedimientos de ajuste |
|------|--|-------|-----------------------------------|-------------------------------|--|
| | Frecuencia | Nivel | | | |
| 1 | 98,0MHz (*1) | 20dB | 98,0MHz | T201,T202 | Ajustar hasta que la tensión de CC entre el terminal no. 2 y masa sea la máxima. |
| 2 | 98,0MHz (*1) | 66dB | 98,0MHz | T1 (corazón primario) | Ajustar hasta que la tensión de CC entre los terminals no. 5 no. 6 a 0V (dentro de ±3mV). |
| 3 | 98,0MHz (*1) | 86dB | 98,0MHz | T1 (corazón secundario) | Minimizar la distorsión de la señal del terminal de salida (OUTPUT). |
| 4 | Repetir los pasos 2 y 3 hasta que ambas especificaciones sean correctas. | | | | |
| 5 | Poner el interruptor de silenciamiento en FM (MF MUTING) en la posición ON. | | | | |
| 6 | 98,0MHz (*1) | 86dB | 98,0MHz | VR3 | Ajustar la señal entre el terminal no. 7 y masa a 76kHz (±400Hz). |
| | Sin modulación | | | | |
| 7 | 98,0MHz (*1) Modulación estereofónica (*1) (Principal=1kHz, izq. o der.) | 86dB | 98,0MHz | VR2 | Ajustar de modo que la separación en el terminal OUTPUT está equilibrada entre los terminales R y L y sea al mismo tiempo la máxima. |
| 8 | 98,0MHz (*1) Modulación estereofónica (*2) | 86dB | 98,0MHz | T202 (Dentro de ±90°) | Ajustar hasta que la distorsion en el terminal OUTPUT R o L sea la mínima. |
| 9 | 98,0MHz (*1) | 36dB | 98,0MHz | VR1 | Ajustar precisamente antes de que se afecte el silenciamiento. |

Sección del sintonizador de AM

- Conectar la antena de cuadro de AM suministrada entre los terminales AM ANTENNA y GND.
- Conectar el generador de señales de AM (AM SG) al terminal AM ANTENNA a través de un resistor de $10k\Omega$.
- Ajustar el TX-940 a la banda de AM (MW) y al modo de sintonización MANUAL.
- Ajustar el selector de paso del canal de AM (AM CHANNEL STEP) en la posición de 9kHz (tipos KU, S y S/G).

(*3) Sintonizador el AM SG con el TX-940.

| Paso | AM SG (400Hz, 30% de modulación) | | Frecuencí- metro del TX-940 | Puntos de ajuste | Procedimientos de ajuste |
|------|--|-------|-----------------------------------|---------------------|--|
| | Frecuencia | Nivel | | | |
| 1 | Sin señal | | 522kHz | T102 | 1,2V CC entre el terminal no. 1 y masa. |
| 2 | Sin señal | | 1611kHz | TC102 | 10V CC entre el terminal no. 1 y masa. |
| 3 | Repetir los pasos 1 y 2 hasta que ambas especificaciones sean correctas. | | | | |
| 4 | 603kHz (*3) | 76dB | 603kHz | T101 | Ajustar hasta que la tension de CC entre el terminal no. 3 y masa sea la máxima. |
| 5 | 1395kHz (*3) | 76dB | 1395kHz | TC101 | |
| 6 | Repetir los pasos 4 y 5 hasta lograrse la máxima sensibilidad. | | | | |



10. SAFETY INFORMATION

1. SAFETY PRECAUTIONS

The following check should be performed for the continued protection of the customer and service technician.

LEAKAGE CURRENT CHECK

Measure leakage current to a known earth ground (water pipe, conduit, etc.) by connecting a leakage current tester such as Simpson Model 229-2 or equivalent between the earth ground and all exposed metal parts of the appliance (input/output terminals, screwheads, metal overlays, control shaft, etc.). Plug the AC line cord of the appliance directly into a 120V AC 60Hz outlet and turn the AC power switch on. Any current measured must not exceed 0.5mA.

ANY MEASUREMENTS NOT WITHIN THE LIMITS OUTLINED ABOVE ARE INDICATIVE OF A POTENTIAL SHOCK HAZARD AND MUST BE CORRECTED BEFORE RETURNING THE APPLIANCE TO THE CUSTOMER.

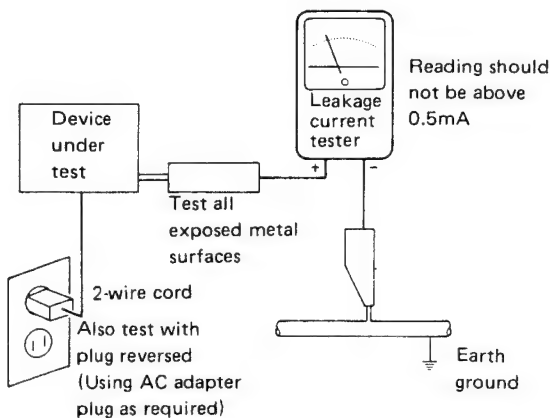
2. PRODUCT SAFETY NOTICE

Many electrical and mechanical parts in the appliance have special safety related characteristics. These are often not evident from visual inspection nor the protection afforded by them necessarily can be obtained by using replacement components rated for voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in this Service Manual.

Electrical components having such features are identified by marking with a ⚠ on the schematics and on the parts list in this Service Manual.

The use of a substitute replacement component which does not have the same safety characteristics as the PIONEER recommended replacement one, shown in the parts list in this Service Manual, may create shock, fire, or other hazards.

Product Safety is continuously under review and new instructions are issued from time to time. For the latest information, always consult the current PIONEER Service Manual. A subscription to, or additional copies of, PIONEER Service Manual may be obtained at a nominal charge from PIONEER.



AC Leakage Test

11. FOR HE AND YP TYPES

The HE and YP types are the same as the KU type with the exception of the following section.

Contrast of Miscellaneous Parts

| Mark | Symbol & Description | Part No. | | | Remarks |
|------|------------------------------------|------------|---------|---------|---------|
| | | KU type | HE type | YP type | |
| | Complex ass'y | GWM-291 | GWM-292 | GWM-292 | |
| | Switch ass'y 1 | non supply | ..... | ..... |  |
| ▲ ★★ | FU1 Fuse (T250mA) | ..... | AEK-037 | AEK-037 | |
| ▲ ★ | T2 Power transformer (120V) | ATT-997 | ..... | ..... |  |
| | (220V, 240V) | ..... | ATT-996 | ATT-996 | |
| ▲ | AC power cord | ADG-073 | ADG-071 | ADG-064 | |
| | R377 (2.2M, 1/2 W) | ACN-029 | ..... | ..... |  |
| | Operating instructions (English) | ARB-558 | ..... | ARB-558 | |
| | (English, French, German, Italian) | ..... | ARE-075 | ..... |  |
| | Packing case | AHE-198 | AHE-199 | AHE-201 | |

Complex Ass'y (GWM-292)

The complex ass'y GWM-292 (for HE and YP types) is the same as the GWM-291 (for KU type) with the exception of following sections.

| Mark | Symbol & Description | Part No. | | Remark |
|------|----------------------|--------------|----------------------|--------|
| | | GWM-291 | GWM-292 | |
| ★★ | Terminal (ANTENNA) | AKA-017 | AKA-018 | |
| | Q307 | ..... | 2SC2458 (2SC2603) | |
| | C24, C25 | CQMA 222J 50 | CQMA 152J 50 | |

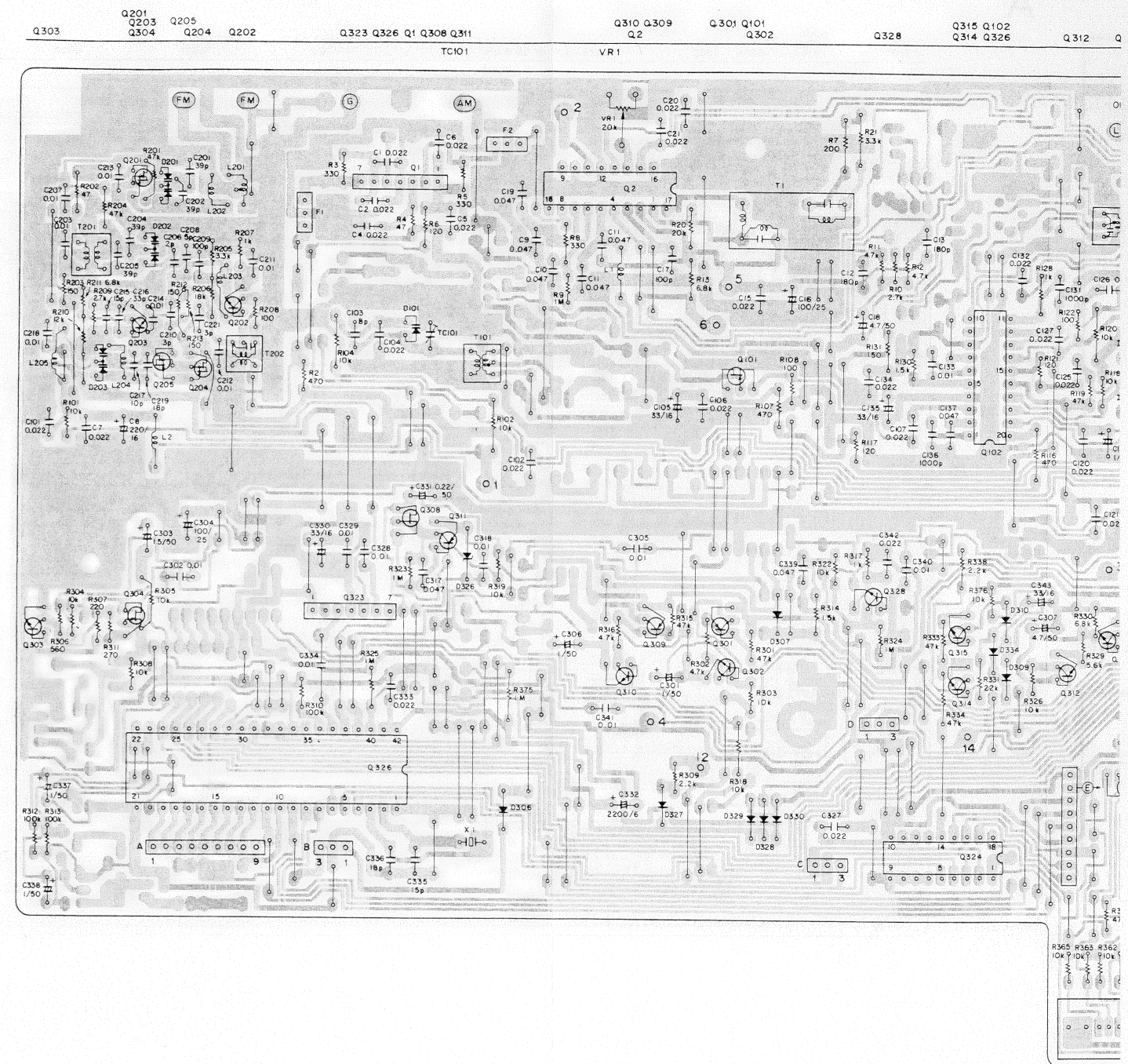
Complex Ass'y (GWM-292)

A

B

C

D



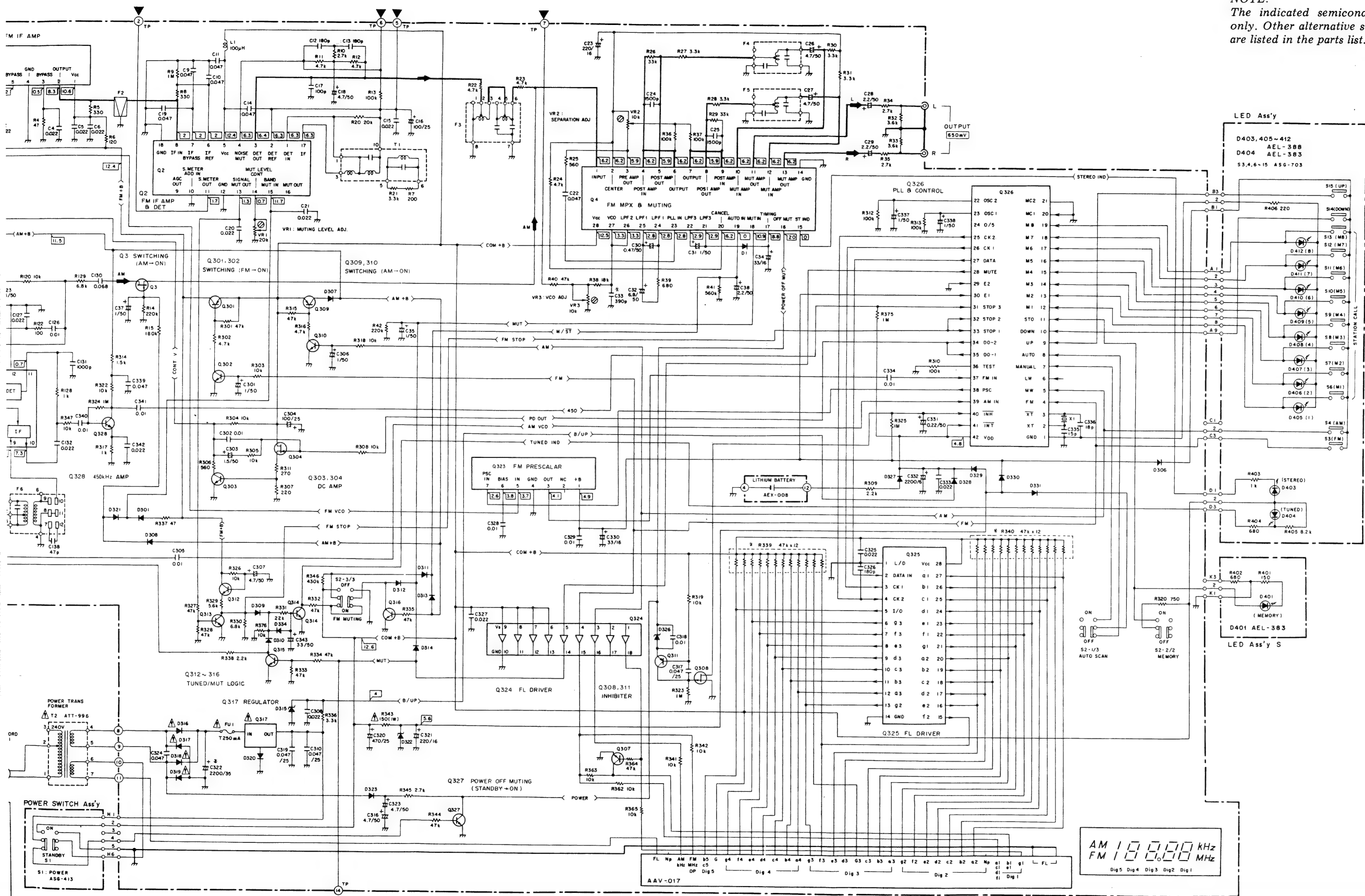
Complex Ass'y (GWM-292)

arks

with the

Q1 μ PC1163H
Q2 PA3007
Q3 2SK246-Y
Q4 PA4006A
Q101 2SK117-Y
Q102 LA1247
Q201, 204, 205 2SK241-Y
Q202 2SC2786-L
Q203 2SC2668
Q301, 309, 311
2SA1048
Q302, 303, 310, 312-316, 327, 328, 307
2SC2458
Q304 2SK246-Y
Q308 2SJ103-Y
Q317 μ PC78M12H
Q323 TD6104P
Q324 M54562P
Q325 TD6301AP
Q326 TC9157P

D1, 301, 306-314,
D320, 323, 327-331, 334
1S1555
D101, 102 SVC321SP
D201-203 1SV147
D315 WZ-046
D316-319 EP01Z
D321 2-1K261
D322 WZ-056
D326 RD3.3EB



NOTE:
The indicated semiconductors are representative ones only. Other alternative semiconductors may be used and are listed in the parts list.

A

B

C

D

12. FOR SS TYPE

The SS type is the same as the KU type with the exception of the following sections.

Contrast of Miscellaneous Parts

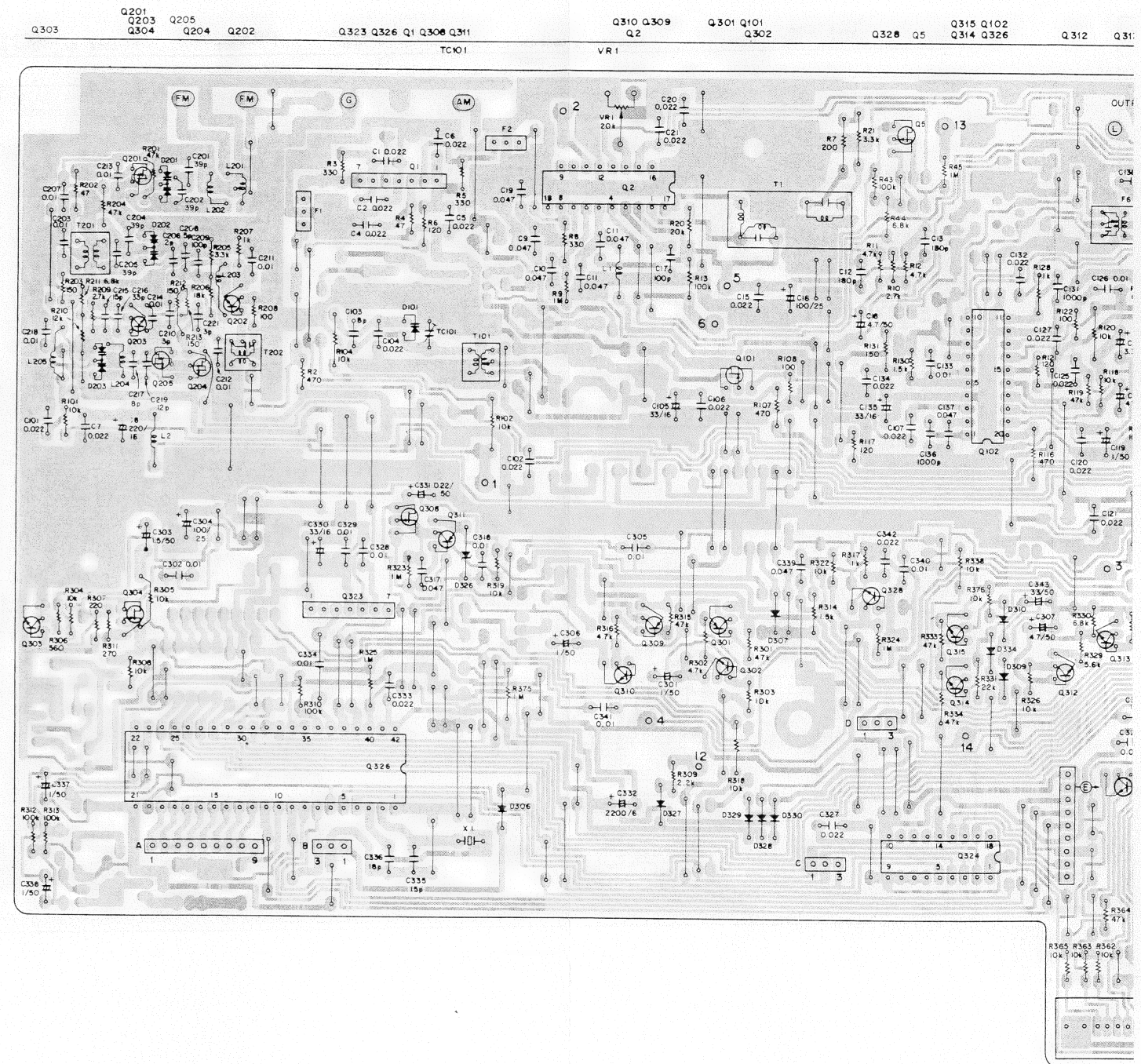
| Mark | Symbol & Description | Part No. | | Remark |
|------|-----------------------------|------------|--------------|---------------------------|
| | | KU type | SS type | |
| | Complex ass'y | GWM-291 | GWM-294 | |
| | Switch ass'y 1 | non supply | ..... |  |
| ⚠ ★★ | FU1 Fuse (250mA) | ..... | AEK-037 | |
| ⚠ ★ | T2 Power transformer (120V) | ATT-997 | ..... |  |
| | (110V, 120V, 220V, 240V) | ..... | ATS-020 | |
| ⚠ | AC power cord | ADG-073 | ADG-072 | |
| ⚠ | S17 Line voltage selector | ..... | AKX-502 | |
| ⚠ | R377 (2.2M, 1/2W) | ACN-029 | ..... |  |
| | Screw (3x10) | ..... | MTZ30P100FZK | for line voltage selector |
| | Packing case | AHE-198 | AHE-201 | |

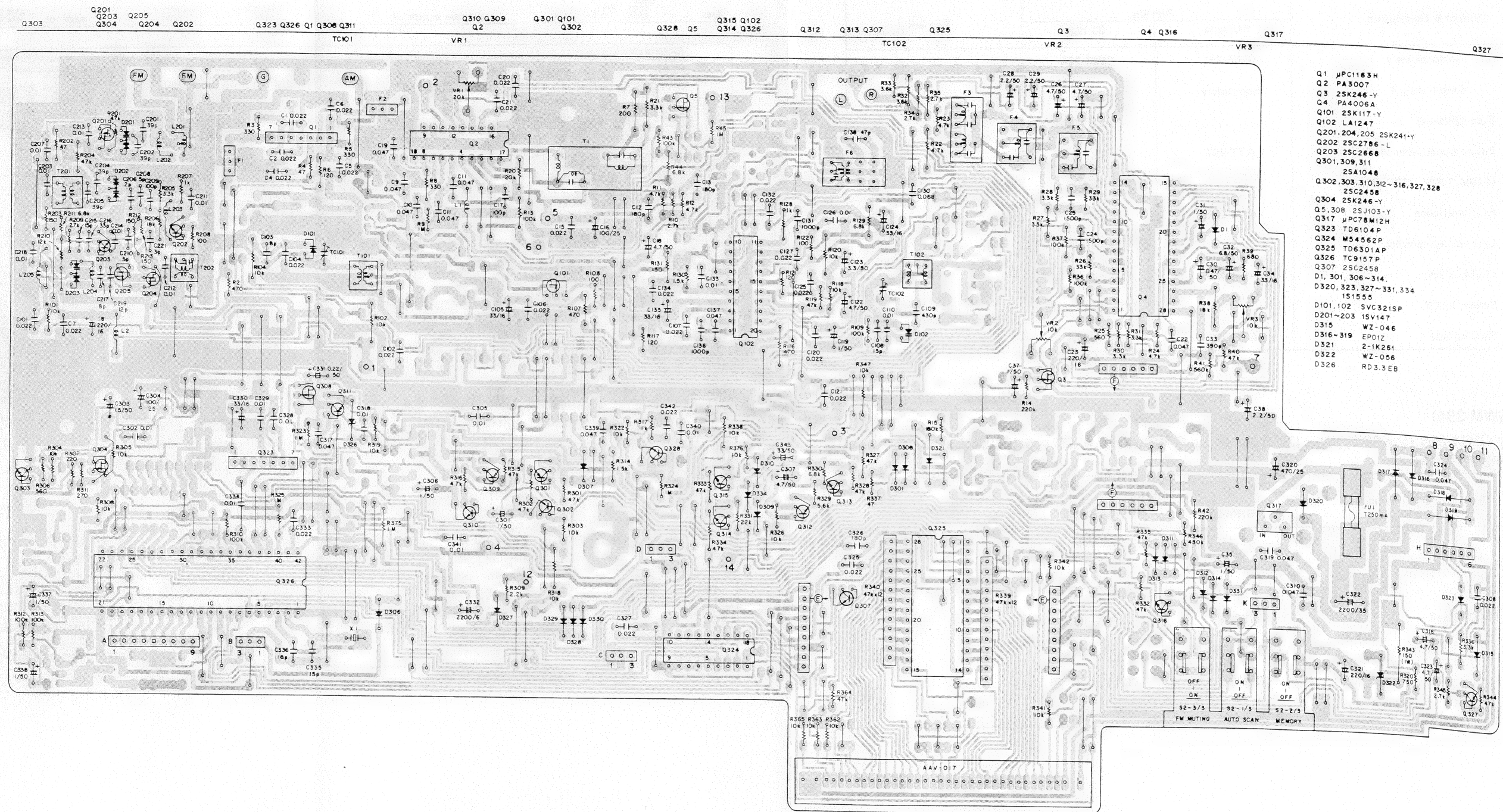
Complex Ass'y (GWM-294)

The complex ass'y GWM-294 (for SS type) is the same as the GWM-291 (for KU type) with the exception of following sections.

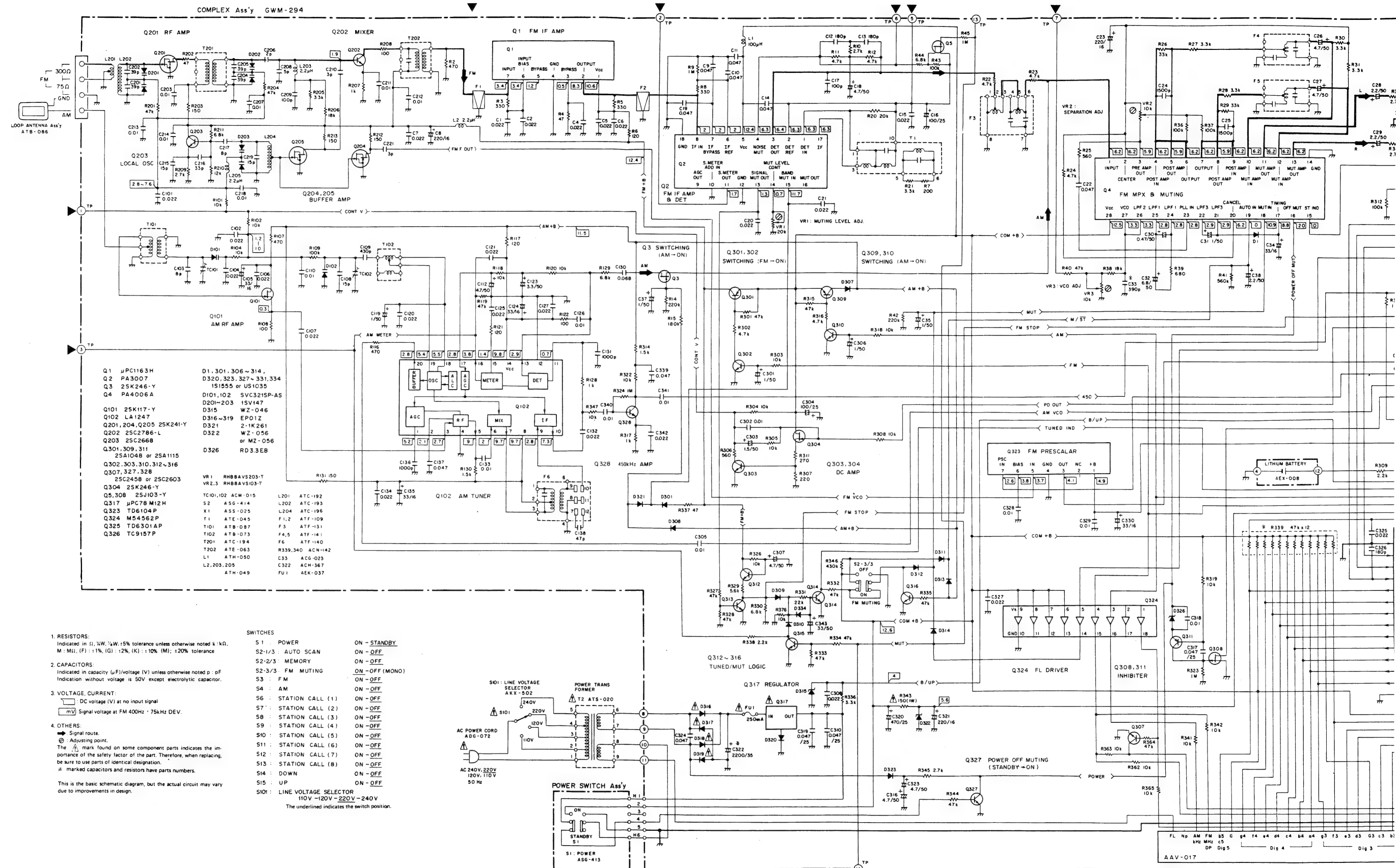
| Mark | Symbol & Description | Part No. | | Remark |
|------|----------------------|---------------|----------------------|--------|
| | | GWM-291 | GWM-294 | |
| ★★ | Q307 | ..... | 2SC2458 (2SC2603) | |
| ★★ | Q5 | ..... | 2SJ103-Y | |
| | L204 FM OSC coil | ATC-195 | ATC-196 | |
| | C217 | CCDCH 100D 50 | CCDCH 080D 50 | |
| | C219 | CCDTH 180J 50 | CCDTH 150J 50 | |
| | C24, C25 | CQMA 222J 50 | CQMA 152J 50 | |

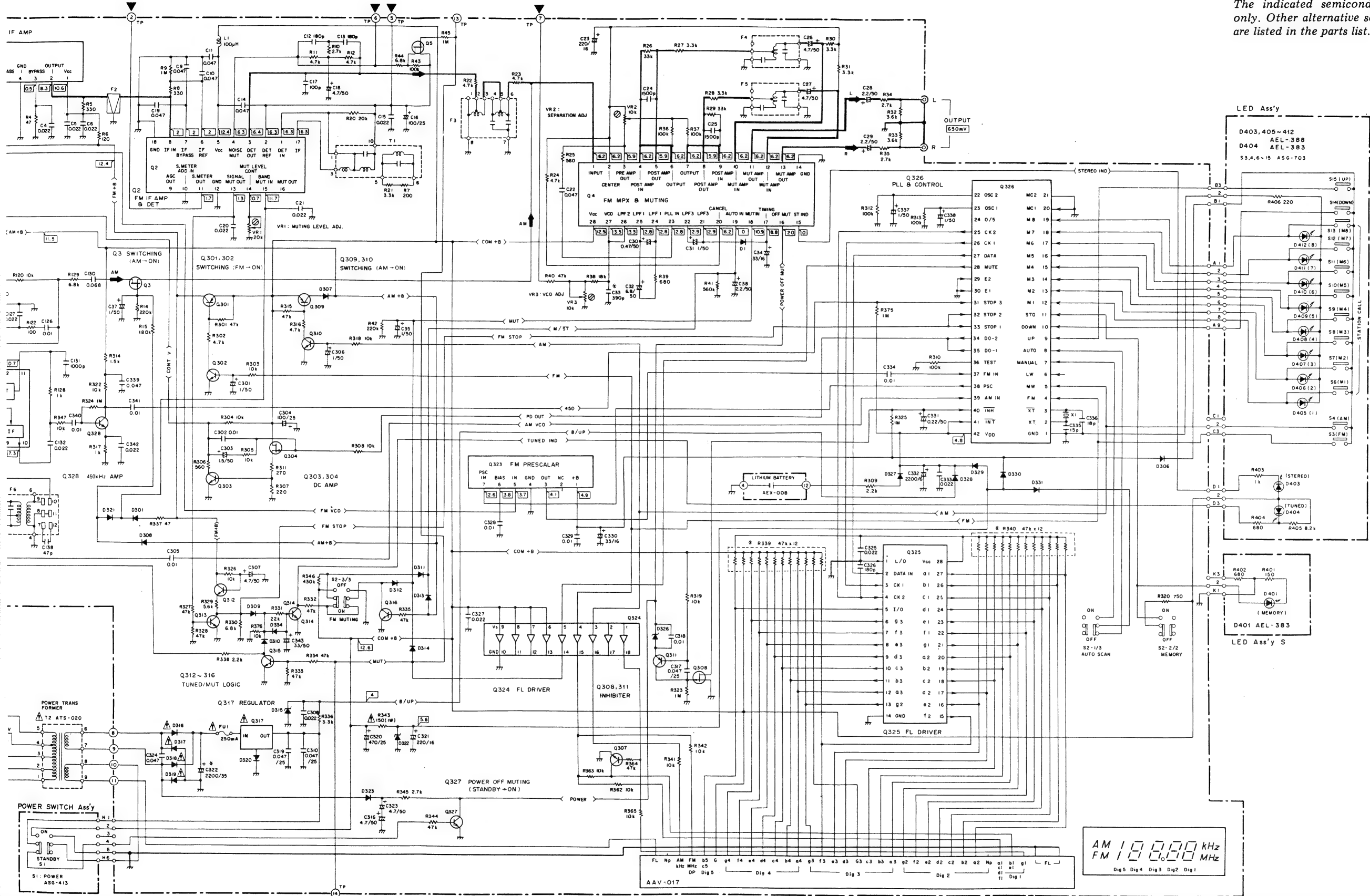
Complex Ass'y (GWM-294)





SCHEMATIC DIAGRAM (FOR SS TYPE)





NOTE:
The indicated semiconductors are representative ones only. Other alternative semiconductors may be used and are listed in the parts list.

A

B

C

D

LED Ass'y
D403, 405-412
D404 AEL-388
S3, 4, 6-15 ASG-703

LED Ass'y S
D401 AEL-383
D402 AEL-383
R401 150
R402 680
R403 150
R404 680
R405 8.2k

AM 100.00 kHz
FM 100.00 MHz
Dig 5 Dig 4 Dig 3 Dig 2 Dig 1

AAV-017

13. FOR S AND S/G TYPES

The S and S/G types are the same as the KU type with the exception of the following sections.

Contrast of Miscellaneous Parts

| Mark | Symbol & Description | Part No. | | | Remarks |
|------|---|----------|--------------|--------------|---------------------------|
| | | KU type | S type | S/G type | |
| | Complex ass'y | GWM-291 | GWM-296 | GWM-296 | (DE-EMPHASIS) |
| | Switch ass'y 2 | ..... | non supply | non supply | |
| ⚠ | S101 Line voltage selector | | AKX-502 | AKX-502 | |
| ⚠ | ★ T2 Power transformer (120V) (110V, 120V, 220V, 240V) | ATT-997 | ..... | ..... |  |
| ⚠ | AC power cord | ADG-073 | ADG-072 | ADG-072 | |
| ⚠ | R377 (2.2M, 1/2W) | ACN-029 | ..... | ..... |  |
| | Screw (3x10) | ..... | MTZ30P100FZK | MTZ30P100FZK | |
| | Operating instructions (English) | ARB-558 | ARB-558 | ARB-558 | for line voltage selector |
| | (Spanish) | ..... | ARC-048 | ..... |  |
| | Packing case | AHE-198 | AHE-201 | AHE-201 | |

Complex Ass'y (GWM-296)

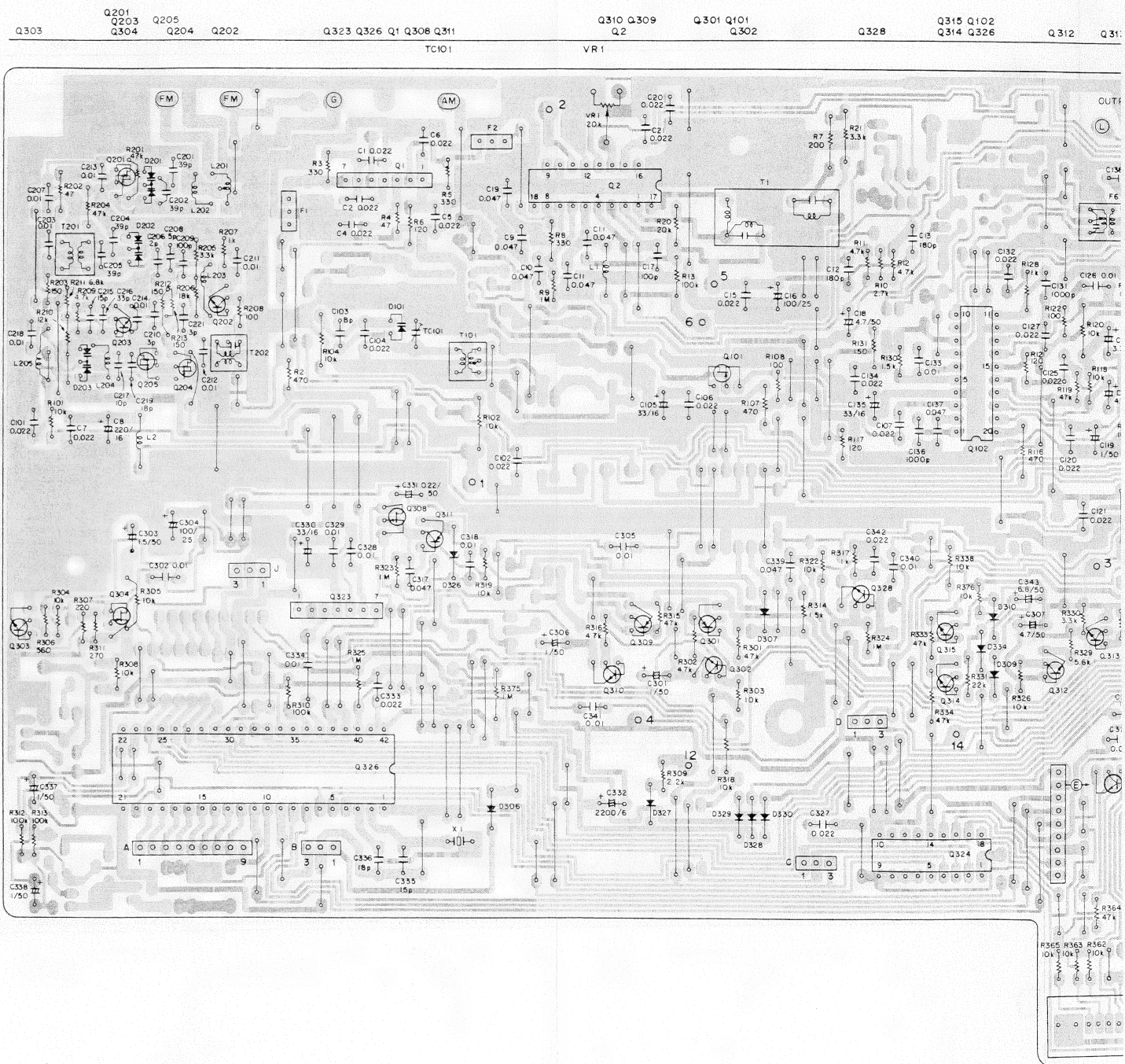
The complex ass'y GWM-296 (for S and S/G types) is the same as the GWM-291 (for KU type) with the exception of following sections.

| Mark | Symbol & Description | Part No. | | Remark |
|----------|----------------------|--------------------|----------------------|--------|
| | | GWM-291 | GWM-296 | |
| Q307 | | | 2SC2458 (2SC2603) | |
| D315 | | WZ-046 | RD4.7EB (HZ4.7EB) | |
| D322 | | WZ-056 (MZ-056) | RD5.6EB (HZ5.6EB) | |
| C24, C25 | | CQMA 222J 50 | CQMA 152J 50 | |
| C343 | | | CEA 330M 16L | |

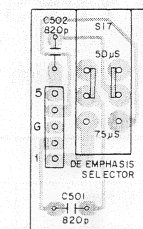
Switch Ass'y 2

| Mark | Part No. | Symbol & Description |
|------|----------|-----------------------------------|
| | ASH-028 | S17 Slide switch (DE-EMPHASIS) |

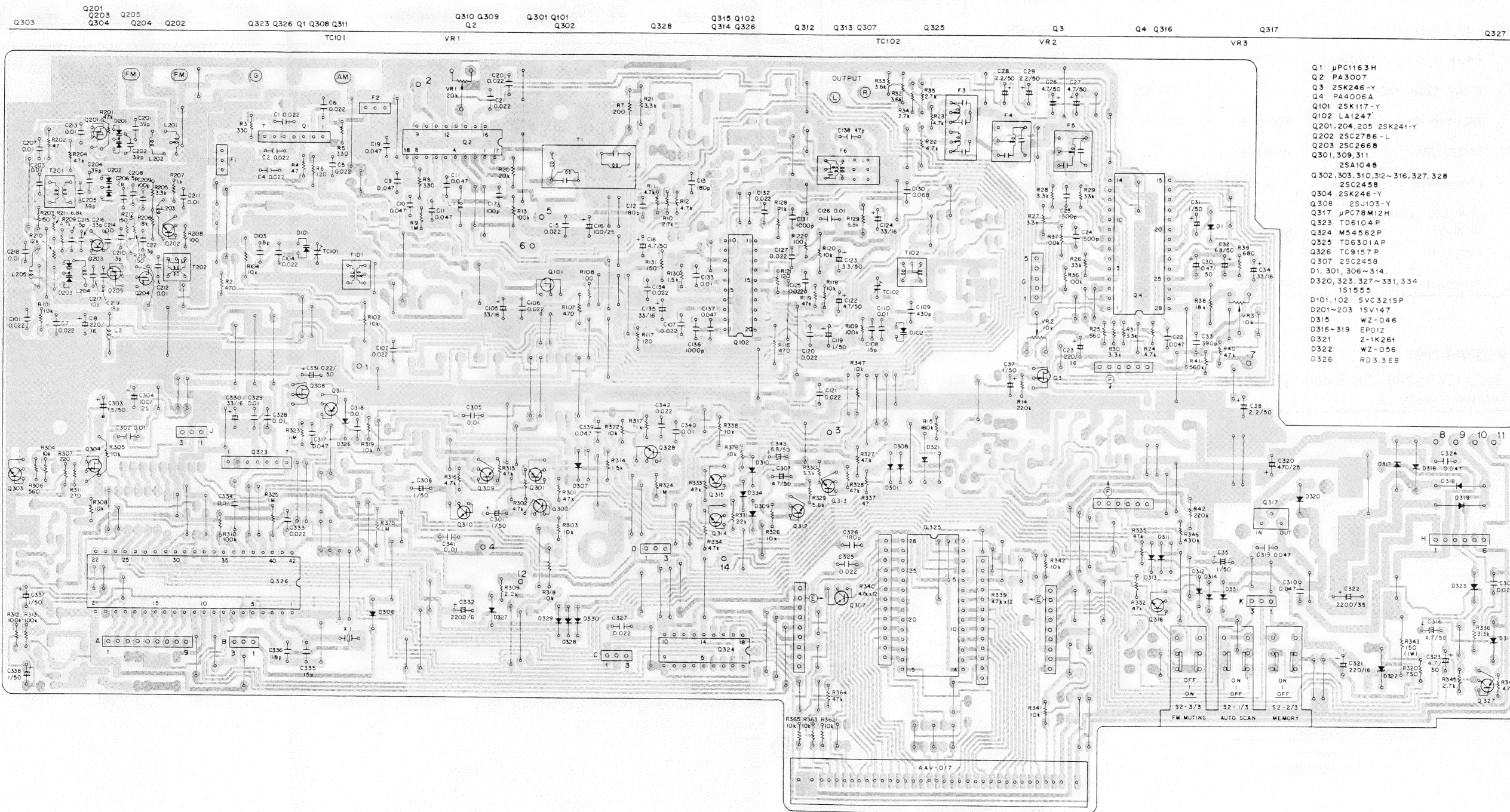
Complex Ass'y (GWM-296)



Switch Ass'y 2



Complex Ass'y (GWM-296)



D



 **PIONEER**

Service Manual

CIRCUIT DESCRIPTIONS



The photo shows the model TX-940.

**ORDER NO.
ARP-353-0**

STEREO TUNER

TX-540 F-50

FM/AM DIGITAL SYNTHESIZED TUNER

TX-940 F-70

- This service manual is made based on the KU, KC types. It can be applied to other types except for minor points.

PIONEER ELECTRONIC CORPORATION 4-1, Meguro 1-Chome, Meguro-ku, Tokyo 153, Japan
PIONEER ELECTRONICS (USA) INC. 1925 E. Dominguez St., Long Beach, California 90810 U.S.A.
PIONEER ELECTRONIC (EUROPE) N.V. Keetberglaan 1, 2740 Beveren, Belgium
PIONEER ELECTRONICS AUSTRALIA PTY. LTD. 178-184 Boundary Road, Braeside, Victoria 3195, Australia

FL © MAY 1983 Printed in Japan

1. TX-540 AND F-50 CIRCUIT DESCRIPTIONS

1.1 IC OUTLINE

TA7640AP Pin Functions

| Pin | Standard voltage (V) | | Pin name | I/O | Function and operation |
|-----|----------------------|-----|---------------|--------------|---|
| | FM | AM | | | |
| 1 | 0 | 1.5 | AM MIX IN | Input | AM mixer input |
| 2 | 0 | 1.5 | AM MIX BYPASS | Input | Connection to AM mixer bias capacitor. Connecting this pin to ground inhibits mixer operation, and switches the pin no.9 output to an FM detector output. |
| 3 | 2.3 | 2.3 | AM OSC | | Connection to AM local oscillator tuning circuit. |
| 4 | 2.3 | 2.3 | Reg | Output | Constant voltage (2.3V) output pin. |
| 5 | 0.9 | 1.0 | AM IF OUT | Input/output | AM IF amplifier output and AM detector input. |
| 6 | 0.9 | 1.0 | Meter OUT | Input/output | Signal meter output and signal indicator driver input. |
| 7 | — | — | LED | Output | Signal indicator output. L level active. |
| 8 | 0 | 0 | GND | | GND. |
| 9 | 1.5 | 1.4 | DET OUT | Output | Output pin: FM output when pin no.2 is 0V. AM output when pin no.2 is 1.5V. |
| 10 | 6.3 | 6.3 | Vcc | | Power supply voltage pin. |
| 11 | 6.3 | 6.3 | FM DET | | Connection to FM quadrature detector tuning circuit. |
| 12 | 1.5 | 1.5 | AM IF BYPASS | | Connection to AM IF amplifier bypass capacitor. |
| 13 | 1.5 | 1.5 | AM IF IN | Input | AM IF amplifier input pin. |
| 14 | 1.5 | 1.5 | FM IF BYPASS | | Connection to FM IF amplifier bypass capacitor. |
| 15 | 1.5 | 1.5 | FM IF IN | Input | FM IF amplifier input pin. |
| 16 | 6.3 | 6.3 | AM MIX OUT | Output | AM mixer output pin. |

μPC1235C Pin Functions

| Pin | Pin name | I/O | Function and operation |
|-----|---------------------|--------|--|
| 1 | Vcc | | Power supply voltage pin. |
| 2 | PRE AMP IN | Input | Preamplifier input pin. |
| 3 | PRE AMP OUT | Output | Preamplifier output pin. |
| 4 | POST AMP BIAS (Lch) | Input | Left channel post amplifier bias pin and NF input pin. |
| 5 | POST AMP BIAS (Rch) | | Right channel post amplifier bias pin and NF input pin. |
| 6 | Rch OUT | Output | Right channel post amplifier output pin. |
| 7 | Lch OUT | | Left channel post amplifier output pin. |
| 8 | GND | | GND |
| 9 | ST IND and 19kHz | Output | Stereo indicator output pin and 19kHz check output pin. |
| 10 | PILOT FILTER | | Connection to pilot detector circuit L.P.F. |
| 11 | PILOT FILTER | | |
| 12 | PILOT IN | Input | Pilot signal input pin. |
| 13 | LOOP FILTER | | Connection to PLL L.P.F. |
| 14 | LOOP FILTER | | |
| 15 | VCO CR | | Connection to VCO capacitance/resistance. |
| 16 | AUTO/MONO | Input | Up to 1.4V : Stereo operation. Between 1.6 and 5V : VCO generation in mono mode. Above 7V : VCO generation stopped in mono mode. |

BA695 Pin Functions

| Pin | Pin name | I/O | Function and operation | L Level Active |
|-----|----------|--------|--|----------------|
| 1 | REF | Input | FM S-curve center voltage input pin. Connected to ground during AM mode. | |
| 2 | SC IN | Input | FM S-curve input pin. | |
| 3 | S IN | Input | Signal meter level input pin. | |
| 4 | CR | | Connection to capacitance/resistance for setting the L1/L3 output blinking frequency. Connect to ground if L1/L3 output blinking not required. | |
| 5 | GND | | GND. | |
| 6 | L 3 | Output | S-curve negative region indicator output. This output appears if the output from pin no.3 exceeds 0.5V and the voltage at pin no.2 is at least 90mV less than the voltage at pin no.1. If pin no.1 is connected to ground, however, there is no output. If resistance/capacitance is connected to pin no.4, the output blinks on and off at the frequency set by that circuit. See Figure 1-1. | |
| 7 | L 2 | Output | S-curve central region indicator and AM mode signal indicator output. This output appears if the output from pin no.3 exceeds 0.5V and the voltage at pin no.2 is at least 90mV less than the voltage at pin no.1. The output is also obtained if an input of at least 0.5V is applied to pin no.3 when pin no.1 is grounded. See Figures 1-1 and 1-2. | L Level Active |
| 8 | L 1 | Output | S-curve positive region indicator output. This output appears when the output from pin no.3 is at least 0.5V, and the voltage at pin no.2 is at least 90mV greater than the voltage at pin no.1. There is no output, however, if pin no.1 is connected to ground. If resistance/capacitance is connected to pin no.4, the output blinks on and off at the frequency set by that circuit. See Figure 1-1. | |
| 9 | Vcc | | Positive power supply voltage pin. | |

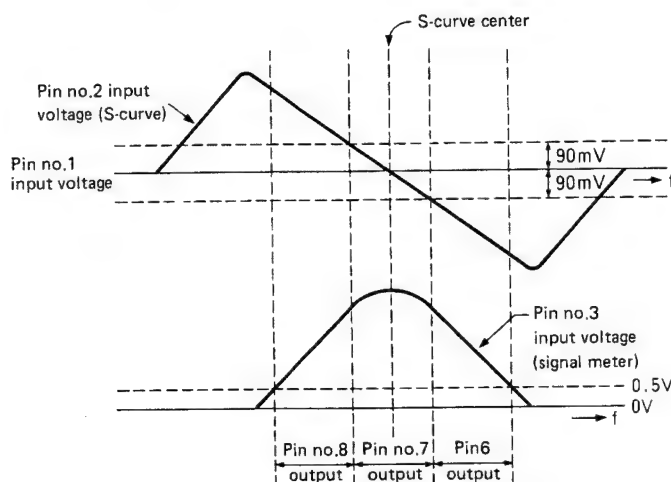


Fig. 1-1 FM mode operation

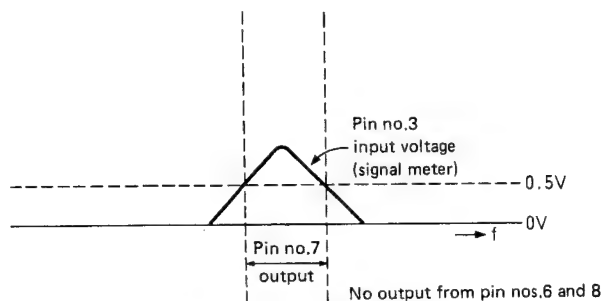
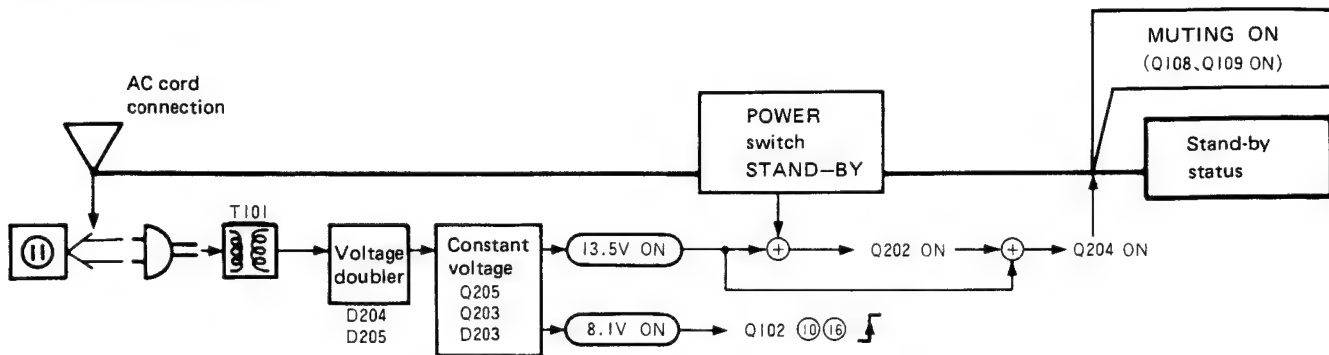


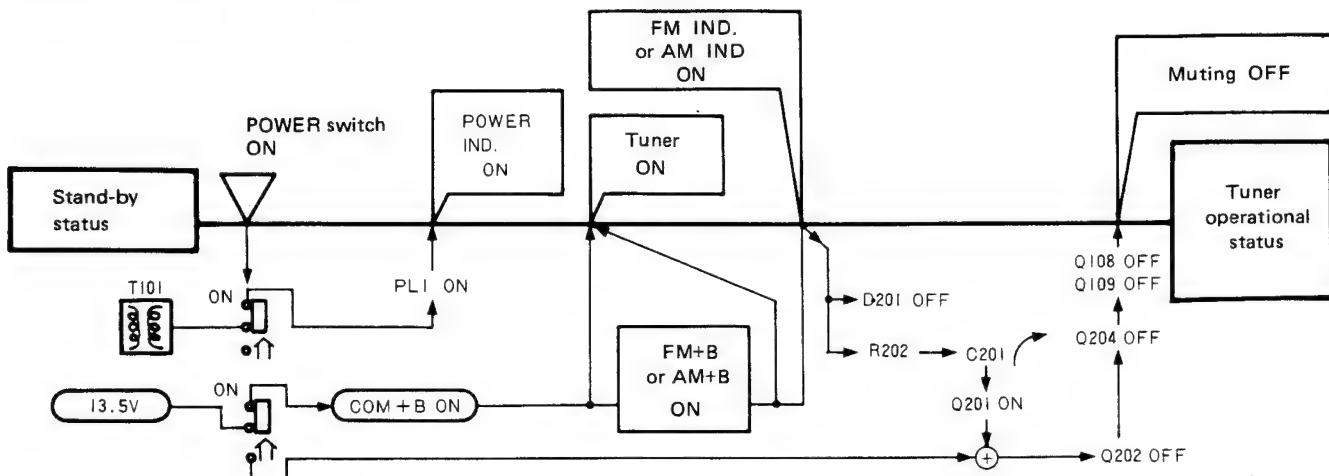
Fig. 1-2 AM mode operation

1.2 OPERATION FLOWCHARTS (See block diagram on page 8)

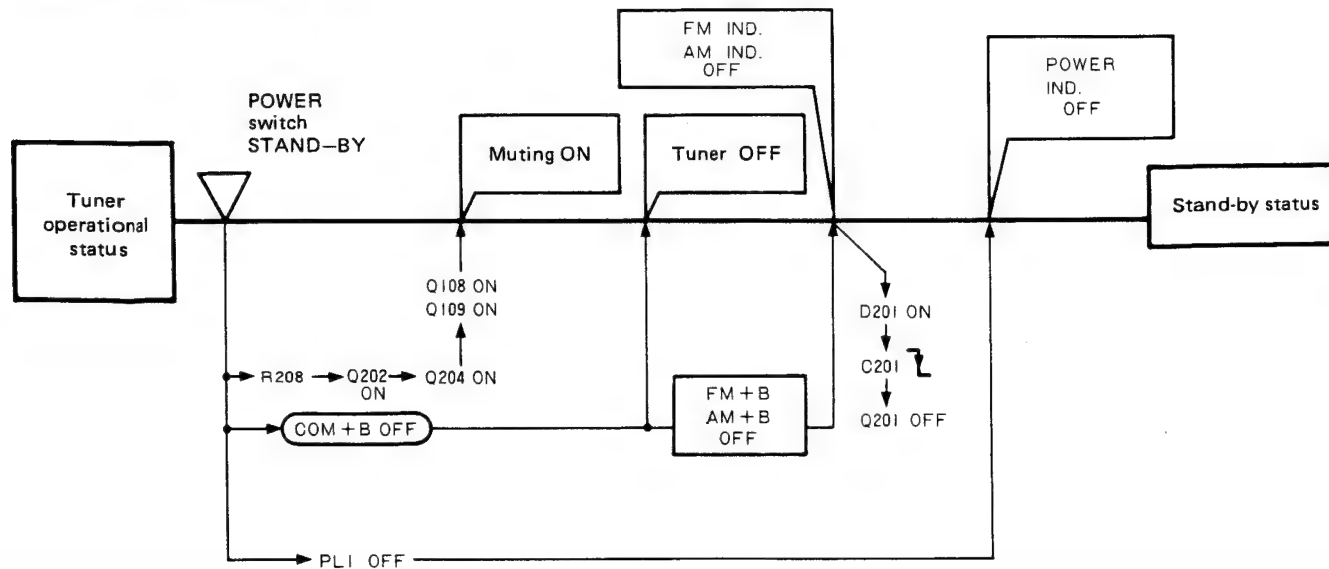
AC Cord Connection



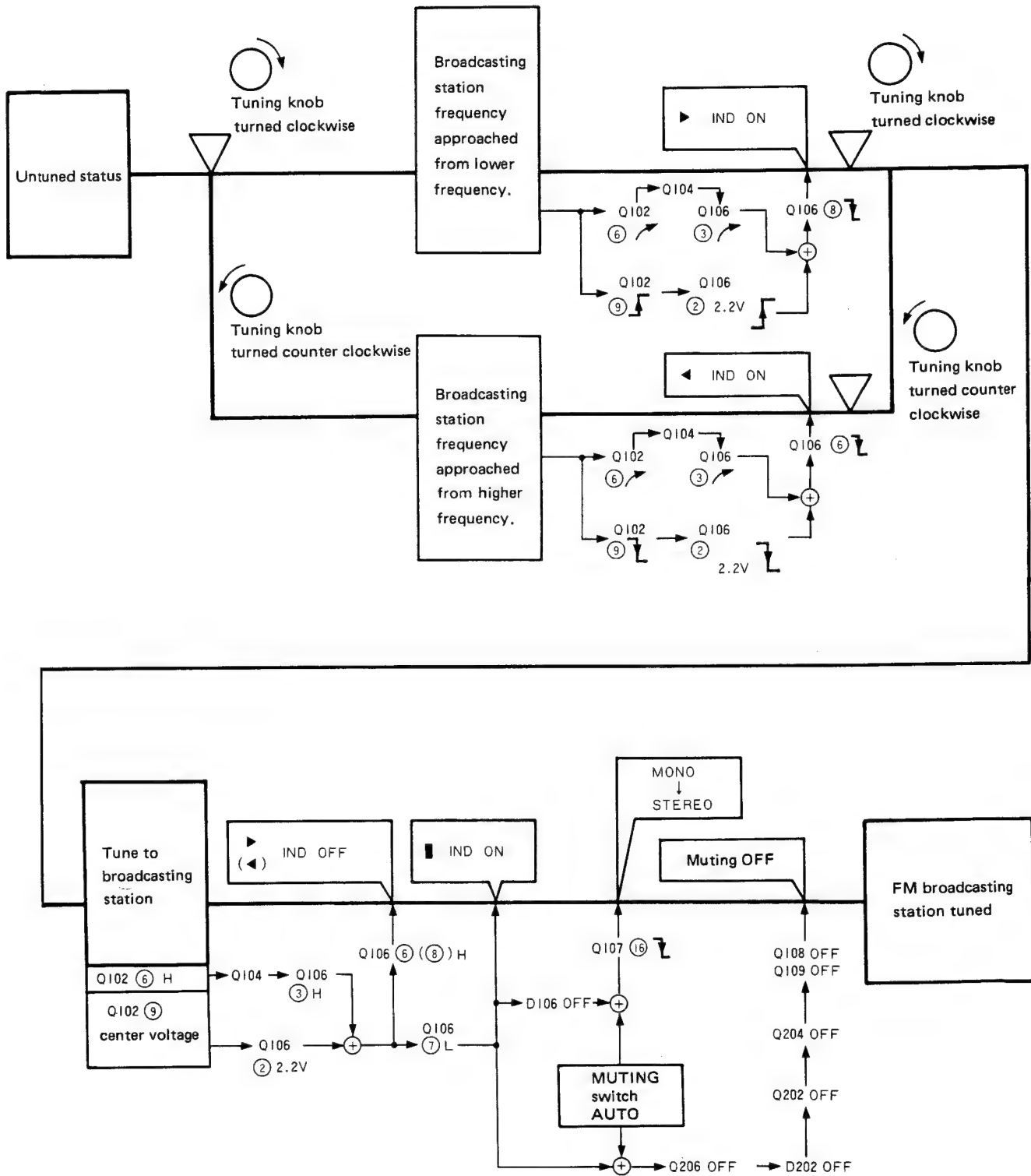
POWER STAND-BY → ON



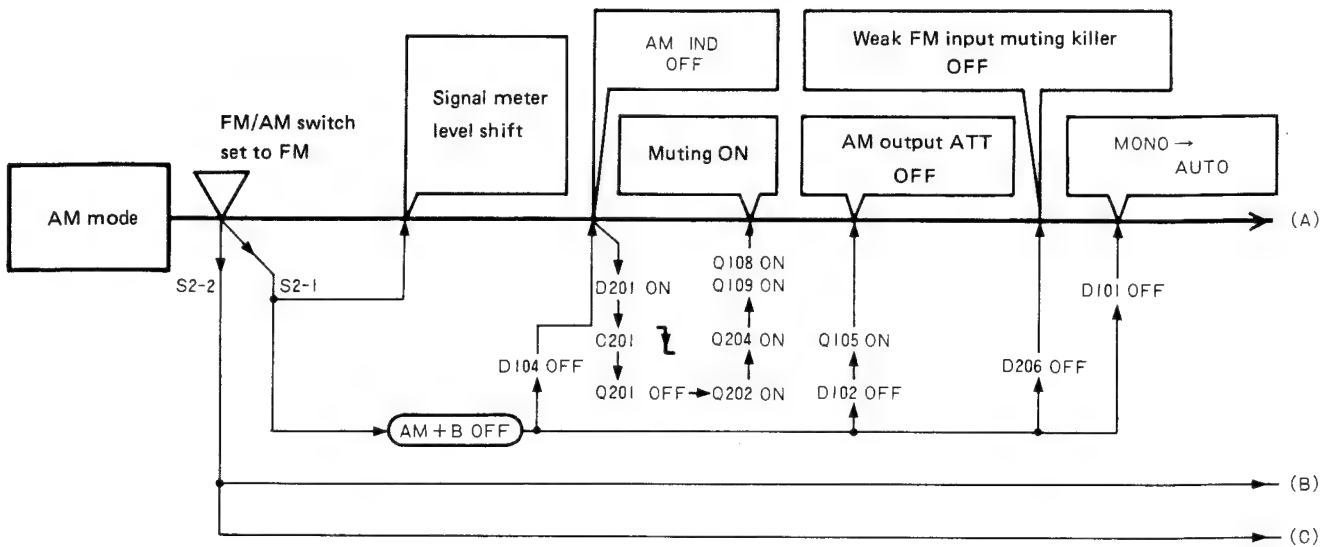
POWER ON → STAND-BY



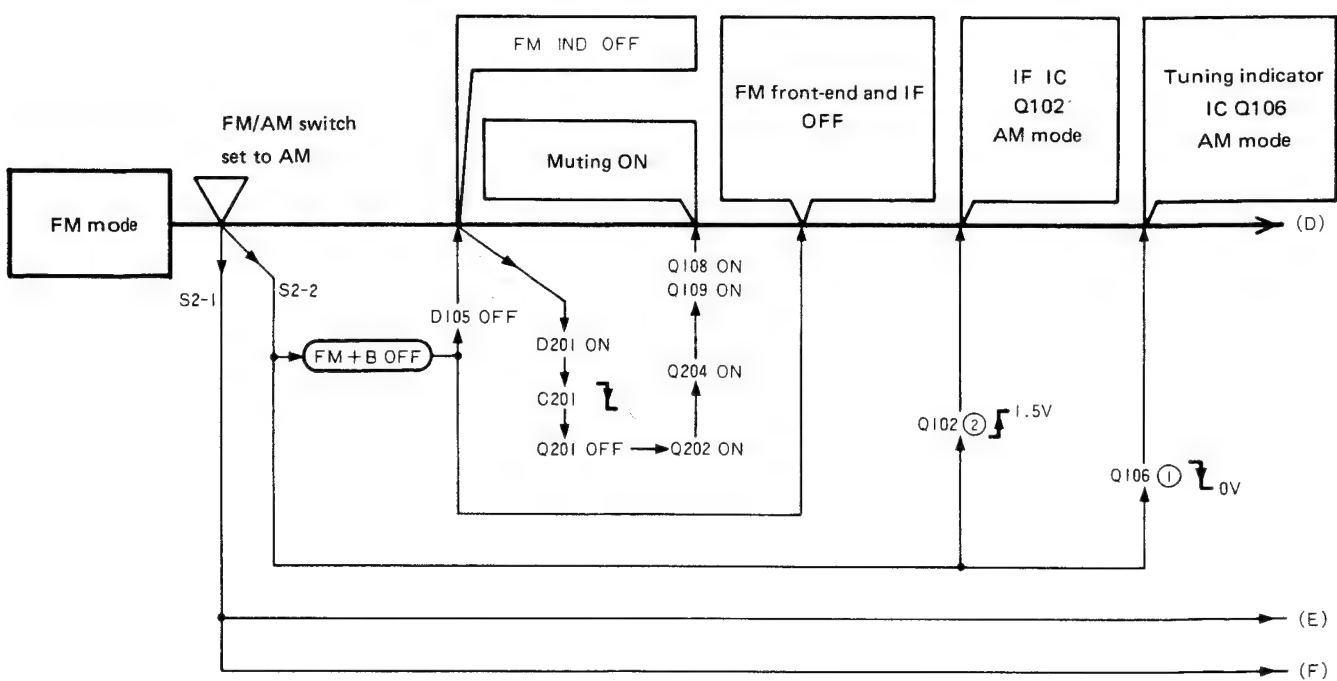
FM Tuning Operation



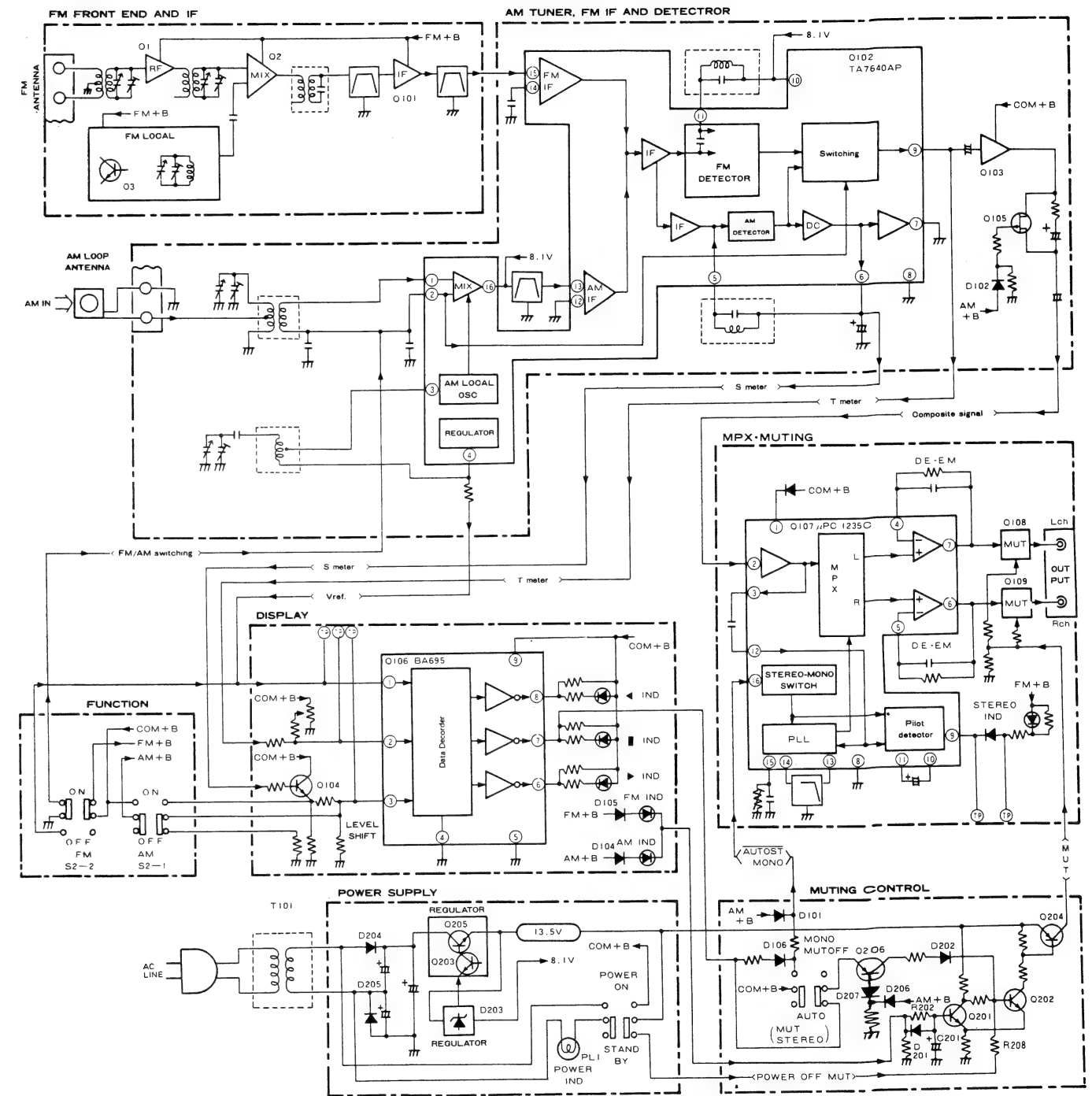
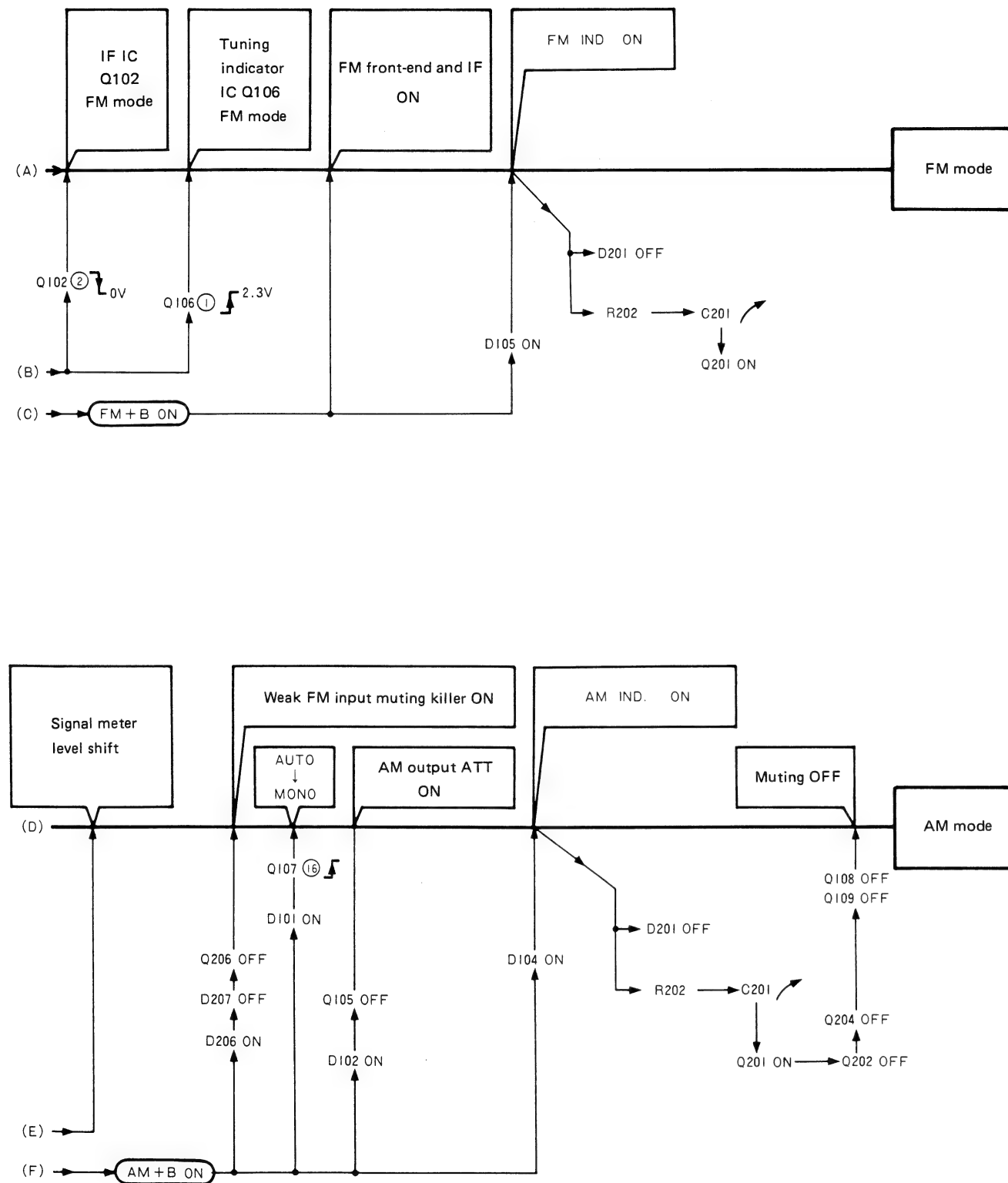
AM → FM



FM → AM

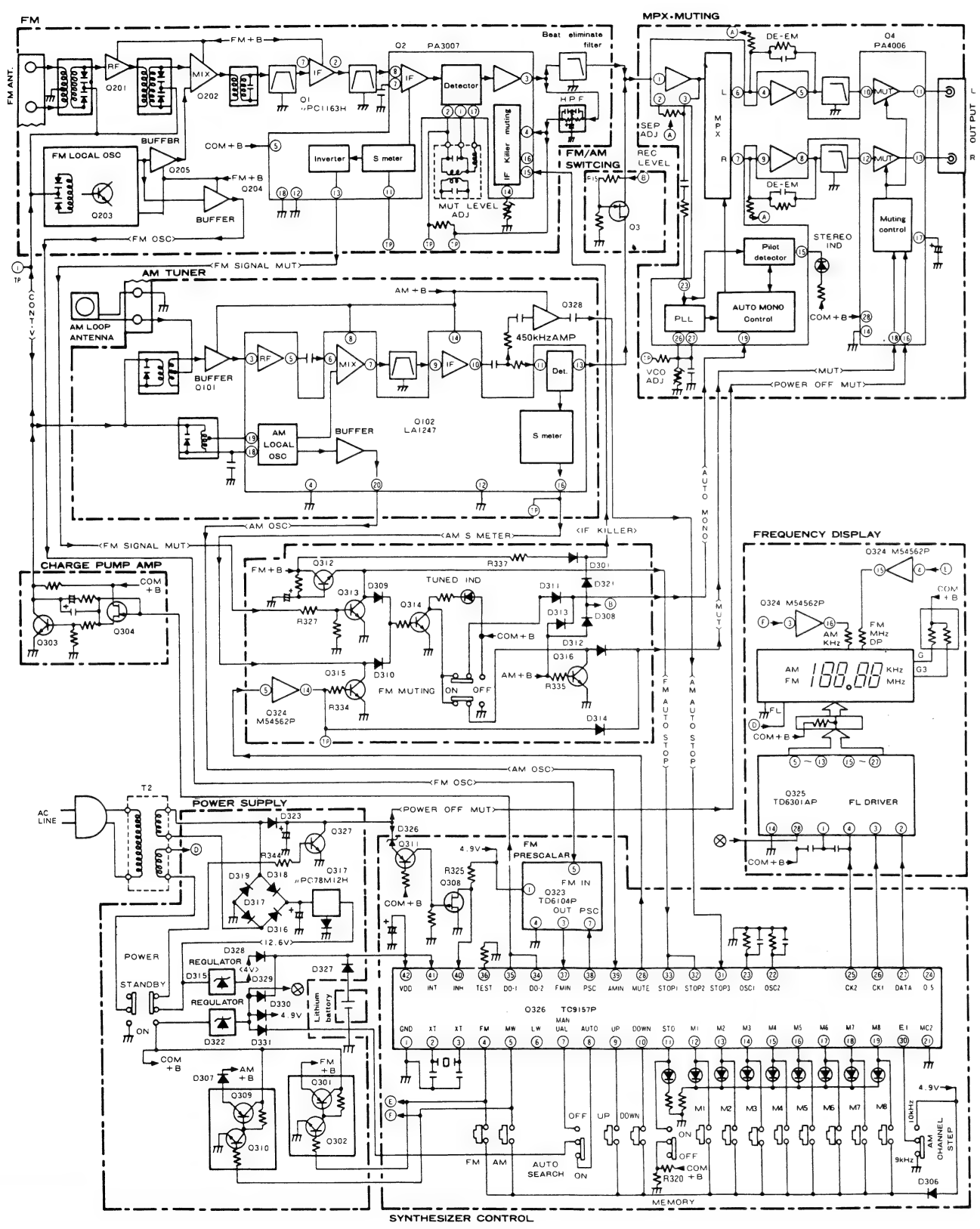


1.3 BLOCK DIAGRAM FOR TX-540 AND F-50

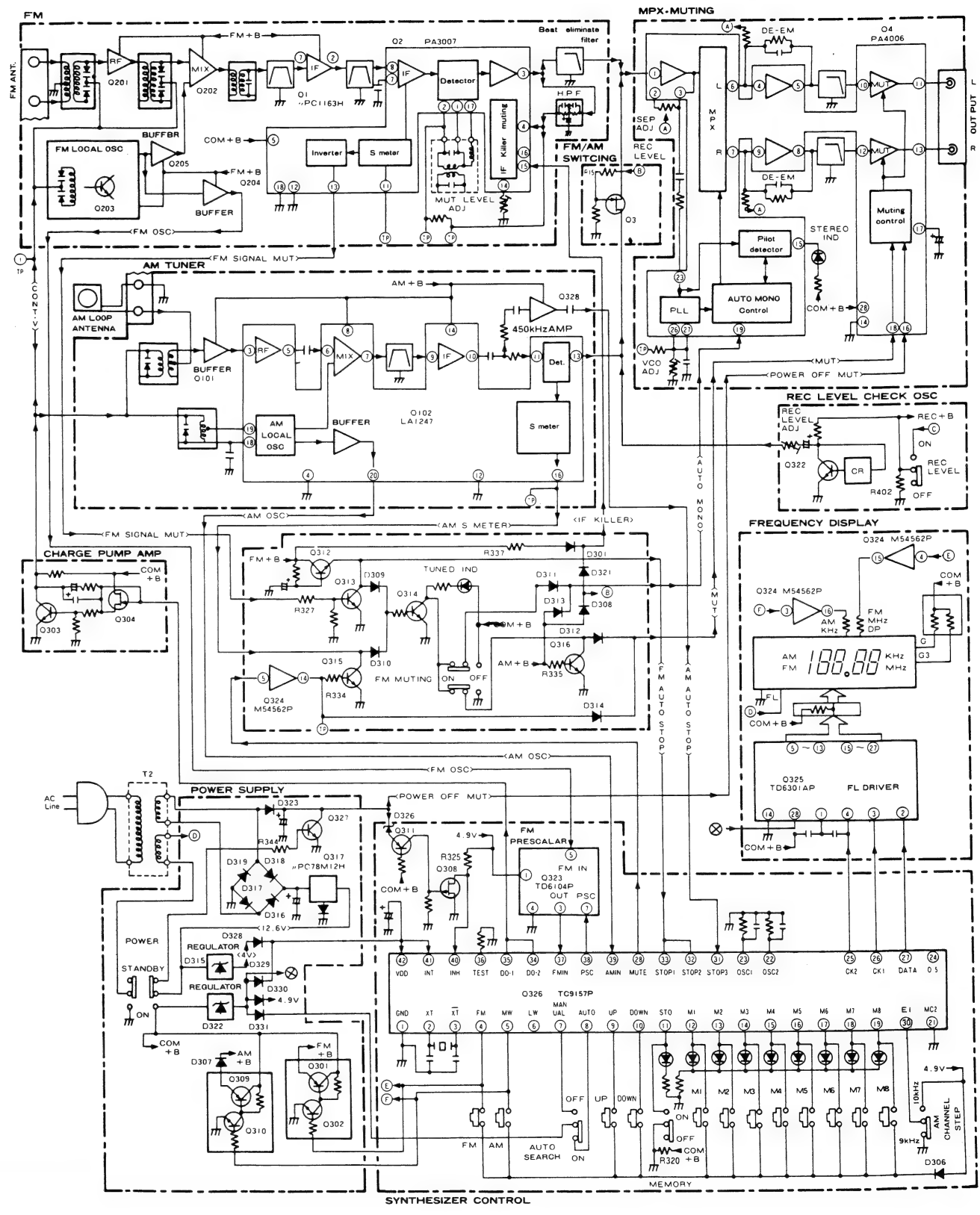


2. TX-940 AND F-70 CIRCUIT DESCRIPTION

2.1 BLOCK DIAGRAM
TX-940

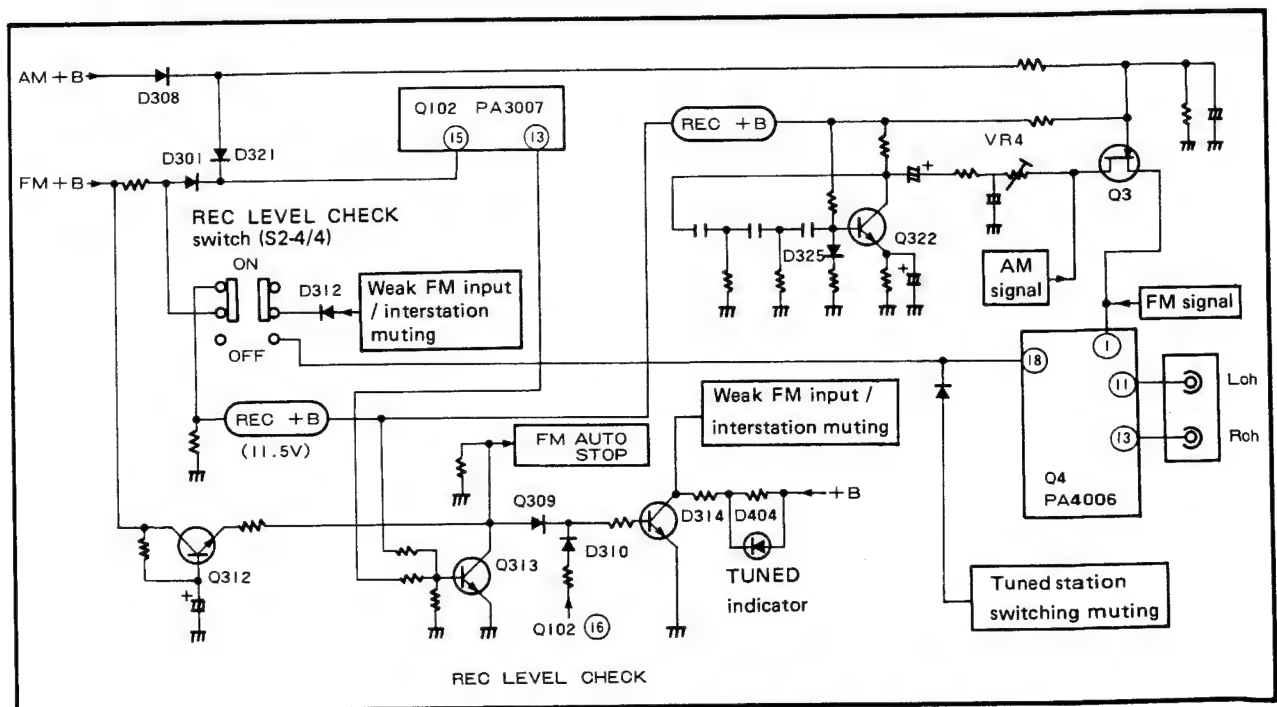
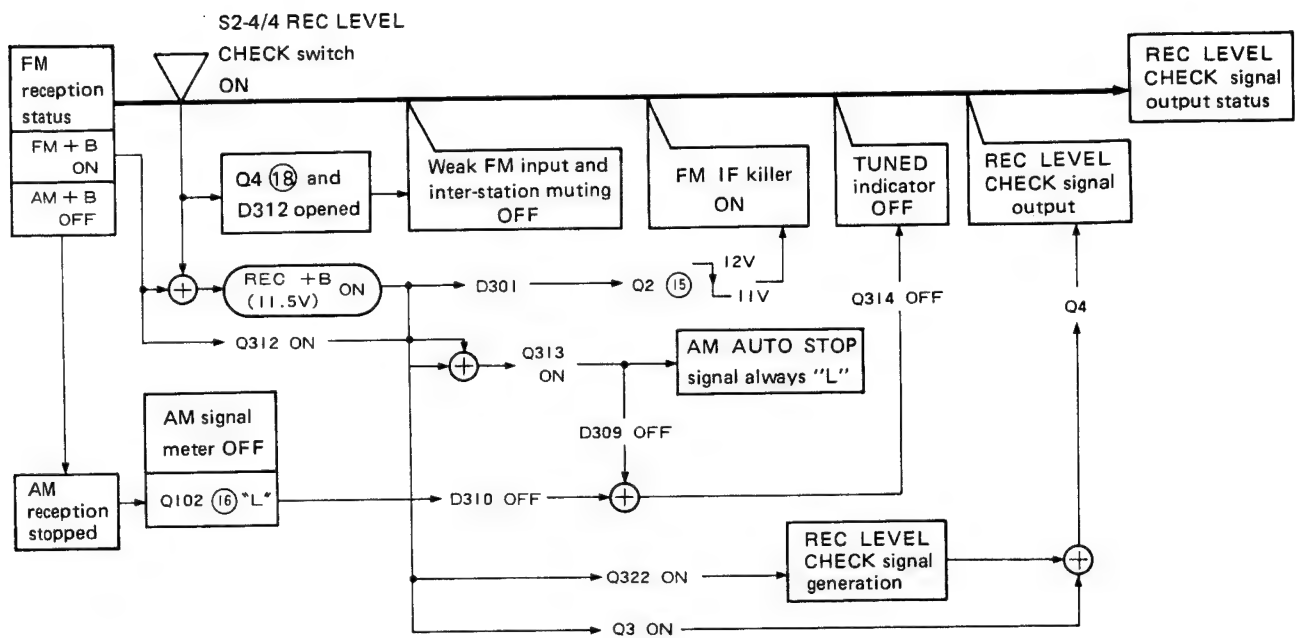


F-70

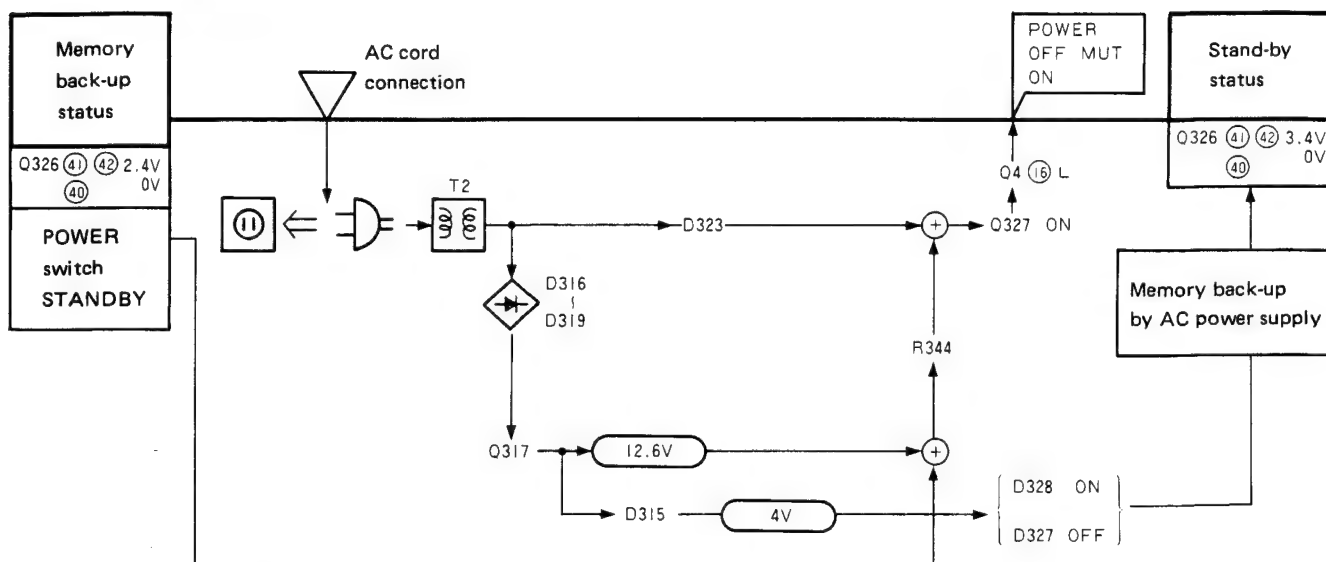


2.2 OPERATION FLOWCHARTS (See block diagram on pages 9 and 10)

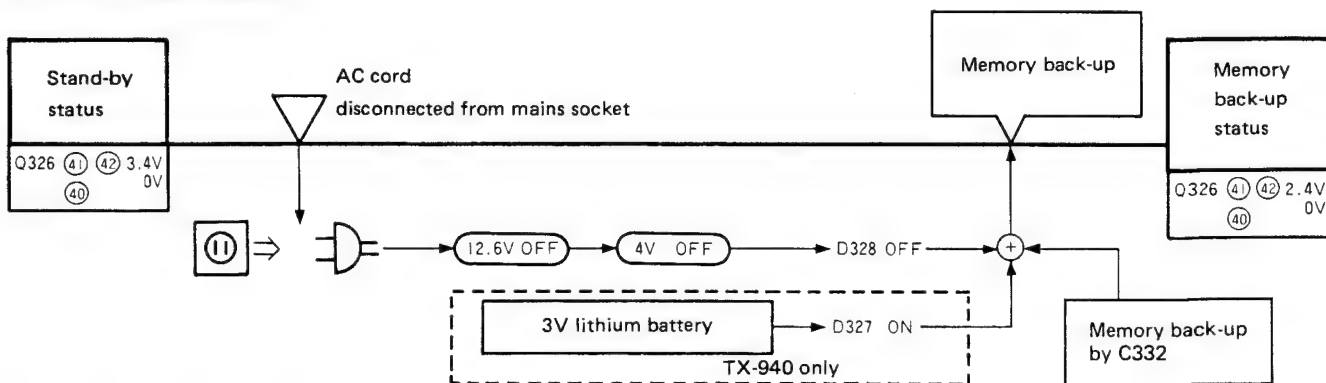
FM → REC LEVEL CHECK Switch ON (F-70 only)



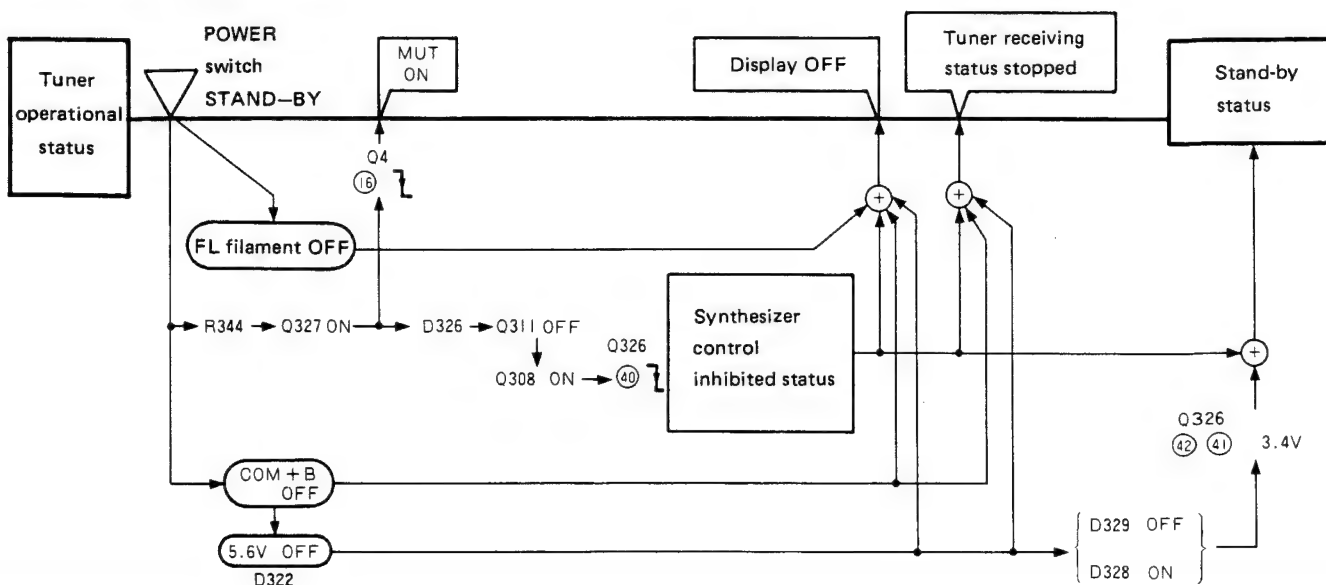
AC Cord Connection



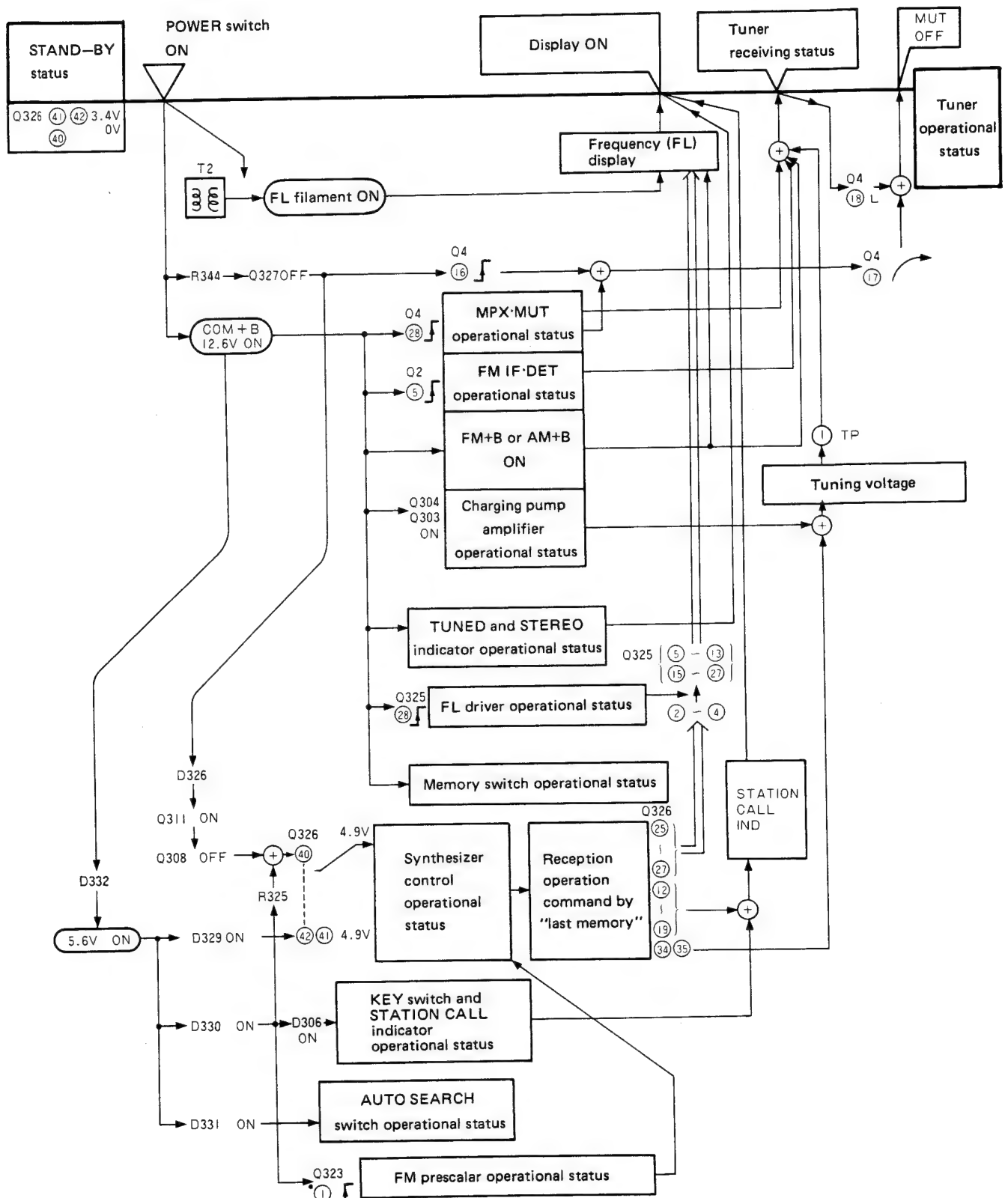
AC Cord Disconnected



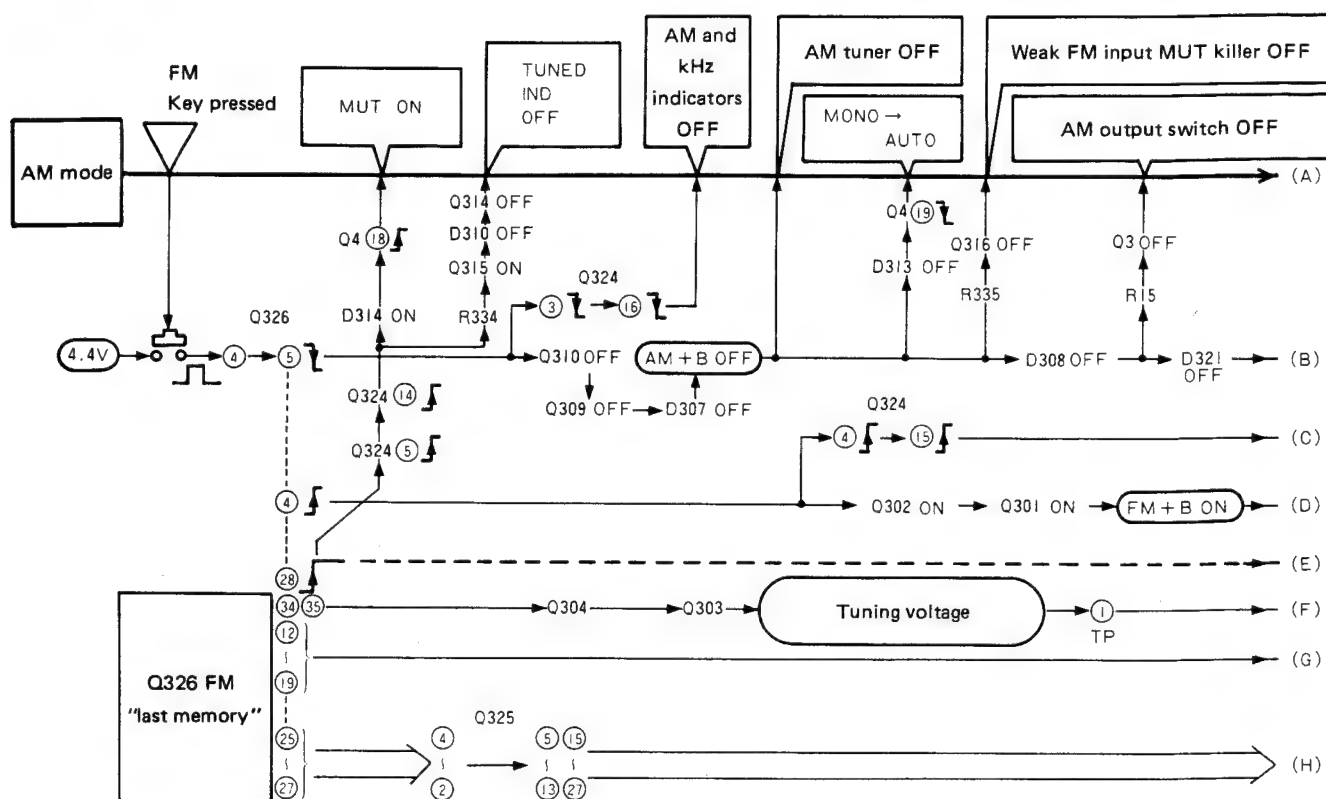
POWER ON → STAND-BY



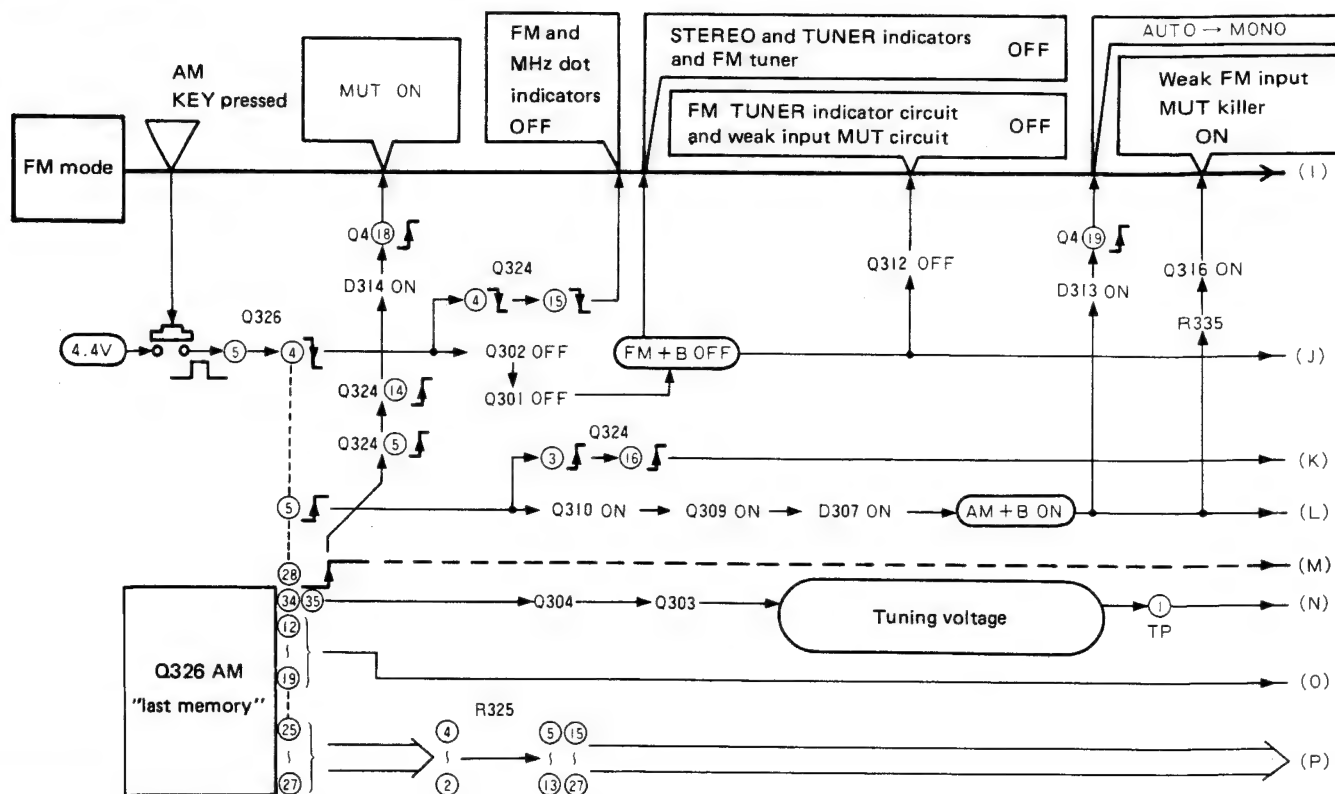
POWER STAND-BY → ON

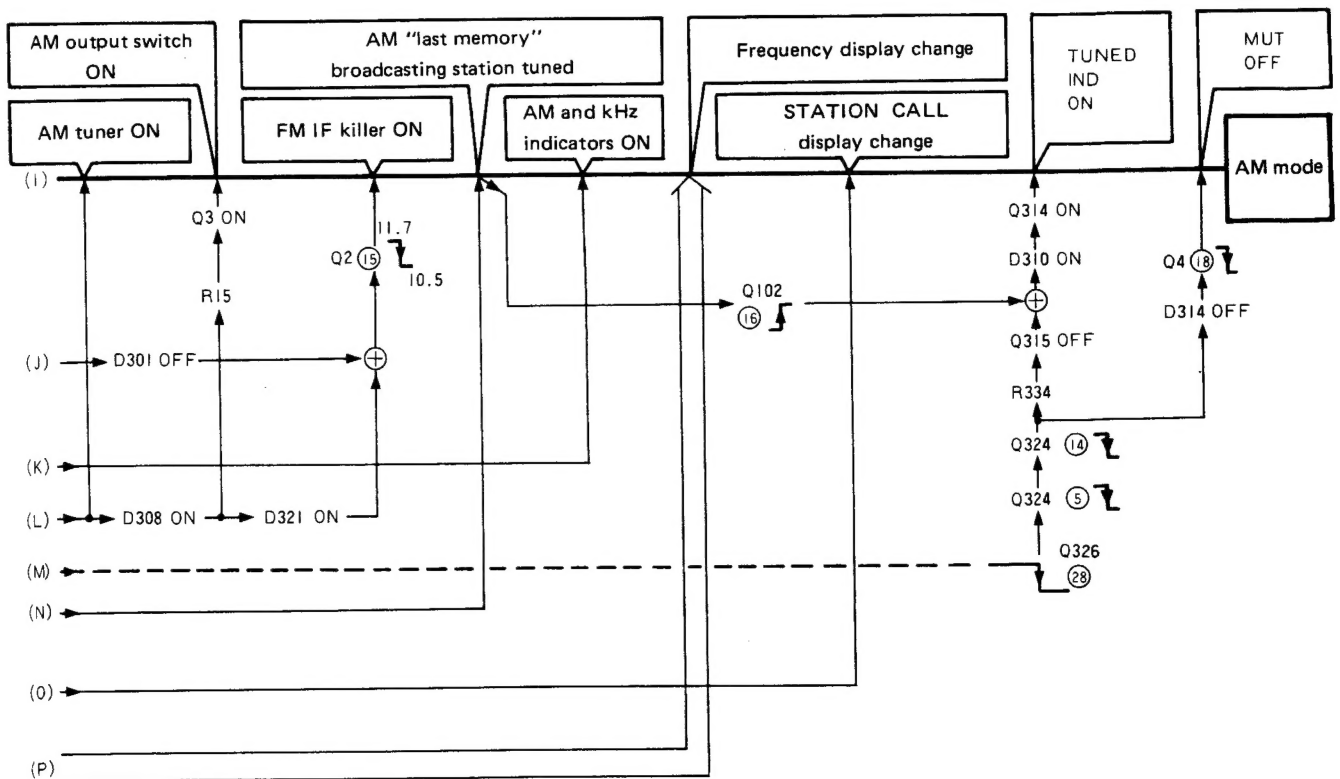
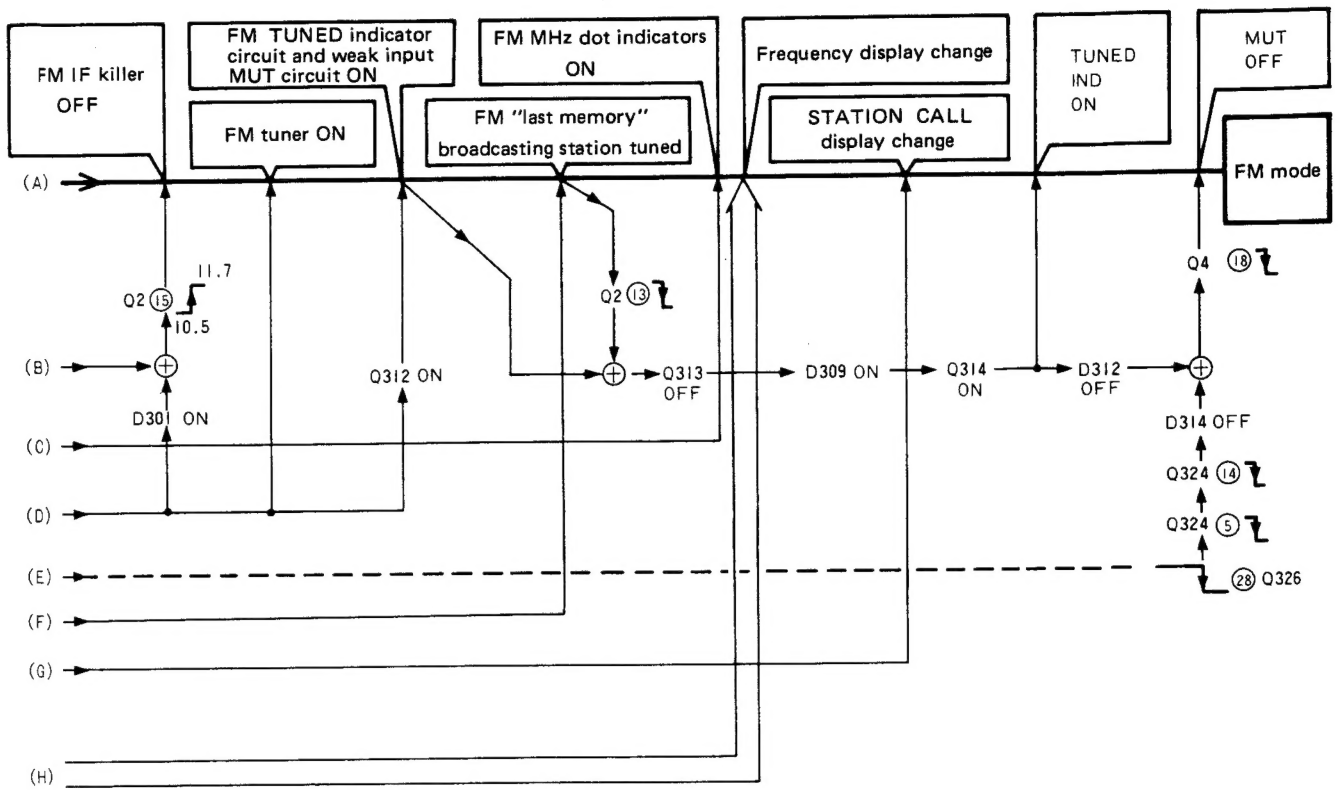


AM → FM

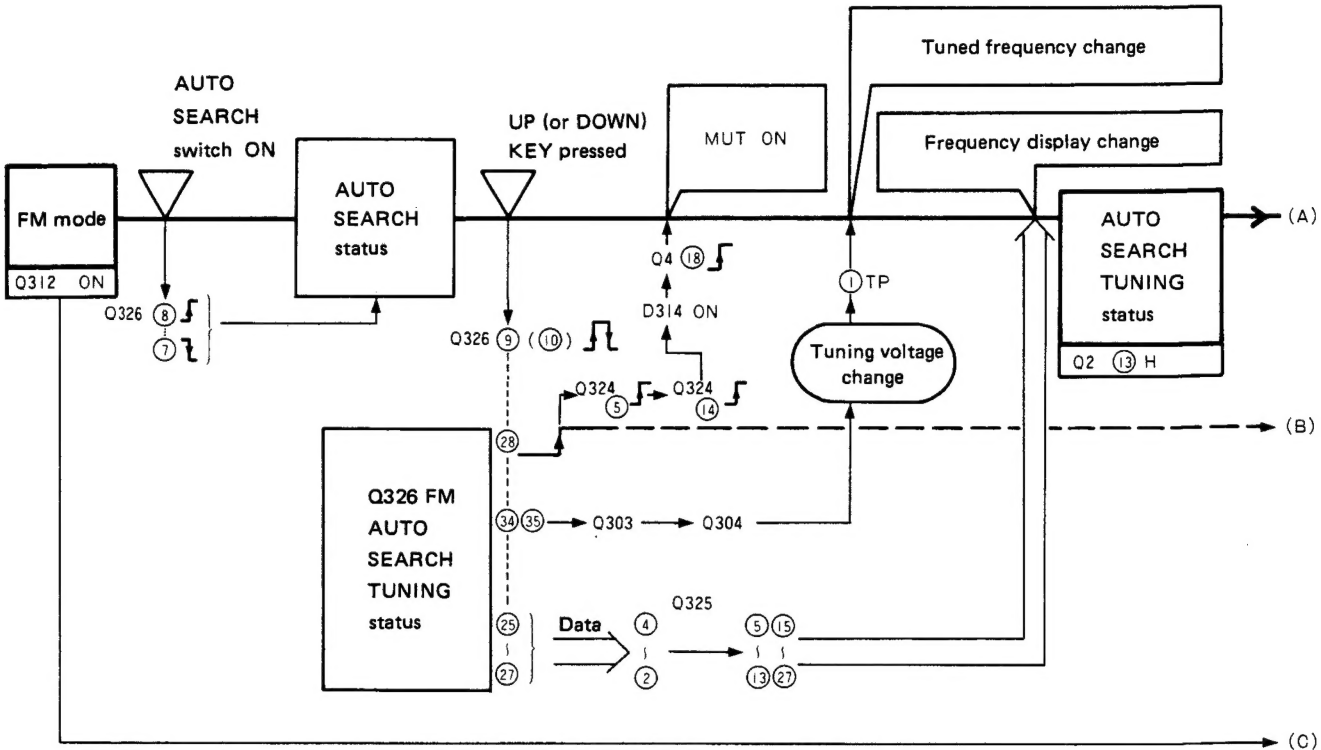


FM → AM

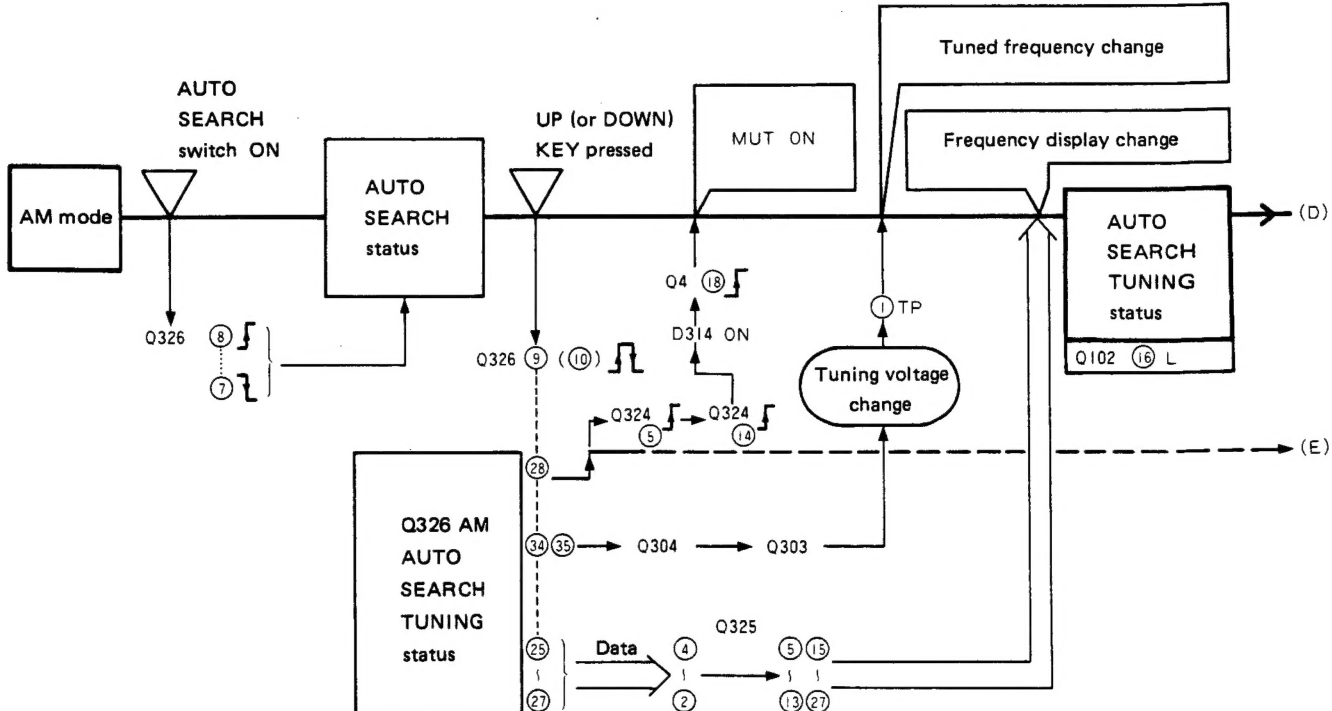


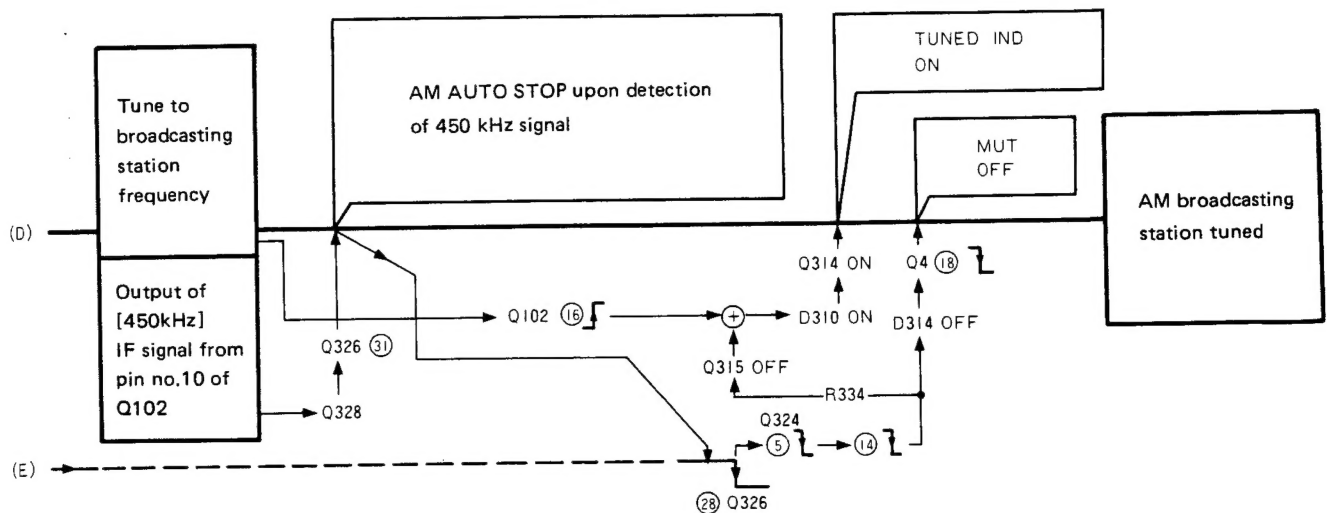
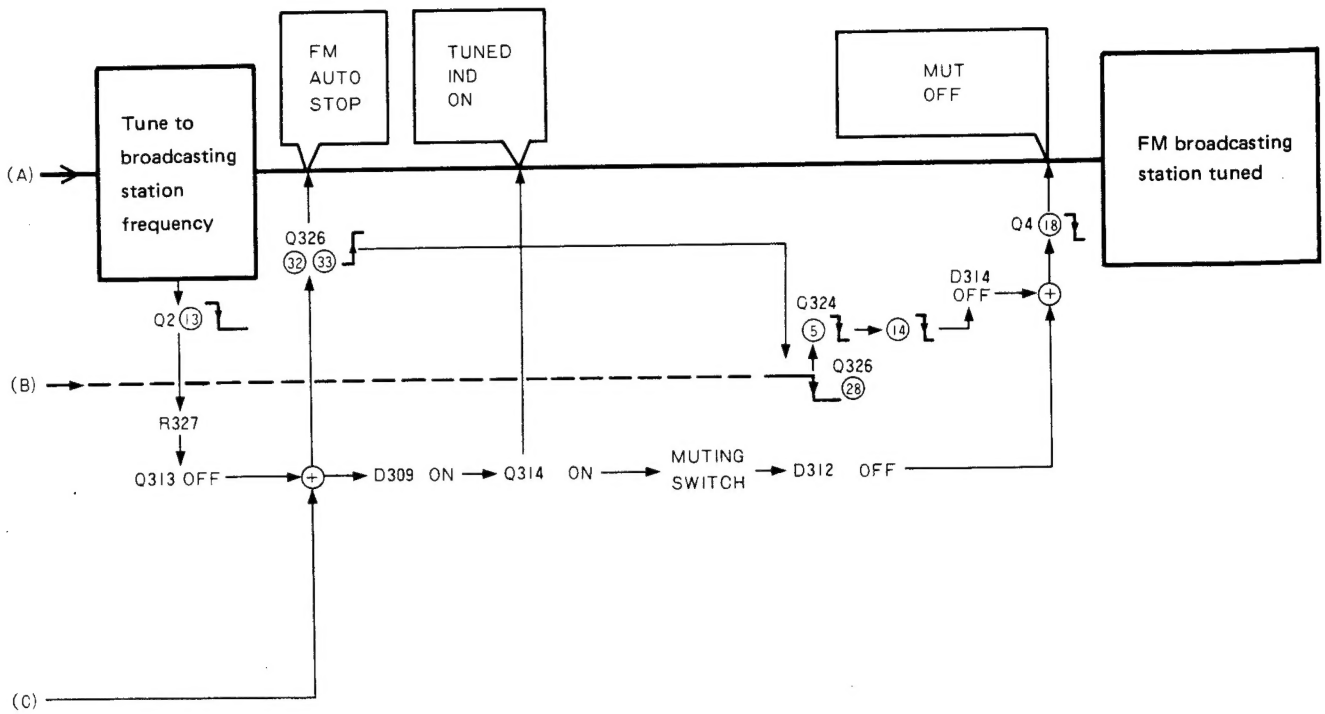


FM AUTO SEARCH TUNING Operation

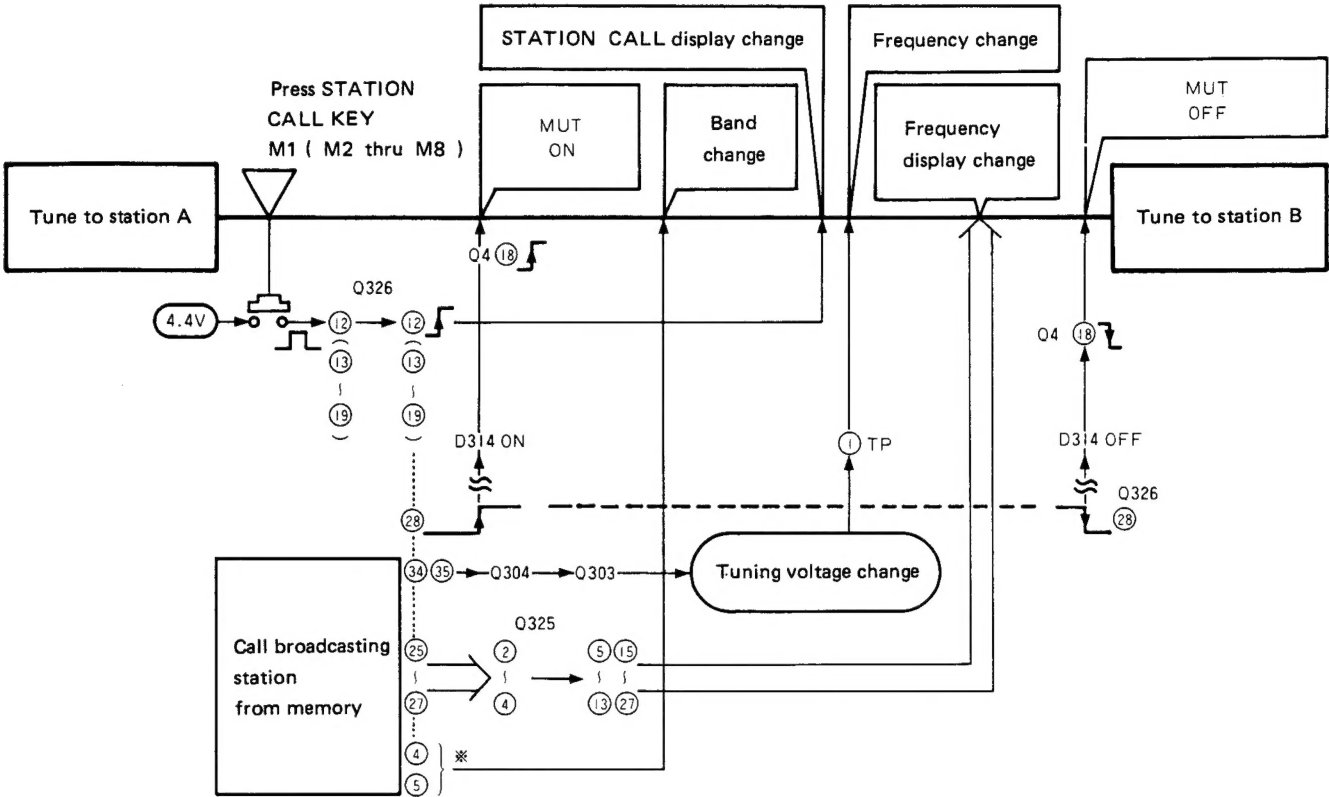


AM AUTO SEARCH TUNING Operation





STATION CALL Operation



Memory Operation

